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MARINE SURVEYOR
Accredited Member of the Yacht Designers and Surveyors Association

REPORT OF A CONDITION SURVEY CARRIED OUT ON THE VESSEL:

“[redacted]”

Accredited Member YDSA

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A. GENERAL NOTES

The following survey was carried out at Brighton Marina on [redacted]

[redacted]

Scope

The survey was carried out as a pre-purchase measure to assess the structural and material condition of the vessel. Where equipment was tested this is detailed in the text. References to condition are in relation to the vessel's age (i.e. good condition does not necessarily mean new).

Recommendations are restricted to:

(A) items which should be addressed before the vessel is used and/or which may affect insurability and;
(B) items which should be addressed in the near future order to prevent future problems.

Recommendations are printed in red for quick reference within the body of report and are also listed in the summary. They do not cover cosmetic or minor defects, although suggestions to address these may be included.

Limitations

Most of the survey was carried out with the vessel afloat. She was lifted and held in slings for an hour to clean and inspect the underwater hull on 29 October. This was insufficient time to use a moisture meter to check for potential moisture related defects.

A sea trial was carried out and did not indicate any serious fault with the engines and transmission but this can not be taken as a guarantee of mechanical condition and it would be advisable to have a marine engineers carry out a full service and inspection.

Parts of the vessel that were covered, unexposed or inaccessible due to fixed panels, mouldings etc. were not examined, so I cannot say these areas are free from defects other than where specified. In particular it is not possible to fully examine the mild steel fuel tanks. No fittings or fastenings were removed for examination other than where specified. Note it is not possible to detect some latent and hidden defects without destructive testing which is not possible without the owner's consent.

The survey is for the client above. No liability is extended to anyone else.

Conditions

The vessel was examined on 29 and 30 October at Brighton. She was taken on a sea trial for about 2 hours on 29 October after being re-launched. The weather was clear, temperature 10-12°c, wind SW2 or less. Day two had showers, temperature 8-10°c. Humidity on both days was around 54% and the dew point around 10° below ambient temperatures. These are adequate conditions for taking moisture meter readings.

SUMMARY

'[redacted] is a Princess 45 motor cruiser built by Marine Projects (Plymouth) Ltd in 1991. She was designed by Bernard Olesinski. Over 300 were built, this being one of the last.

[redacted] is in sound structural condition and in most respects above average condition for her age. She is well equipped as detailed in the brokers inventory. A short sea trial on 29 October showed no serious faults with the engines and transmissions.

She appears to have been very little used by the present owner. The engines are original and have 297 hours on their counters. From the amount of weed growth on the bottom it is likely the sea trial is the first time she has left harbour this year. Recent maintenance has been limited, in particular the anodes have completely eroded and there is now severe electrolytic corrosion to one of the propellers. This must be dealt with urgently as there is a risk the vessel could sink if the anode studs or other through hull fitting fail.

The mild steel fuel tanks are corroded and will eventually need replacement which will involve lifting out the engines to access the tank space

Recommendations

(A) Defects which should be rectified before vessel is used and/or which may affect insurability:

1. Repair the teak grating on the bathing platform.
2. Replace the port propeller and the crown nuts on both propellers. Draw the port shaft to check for corrosion at the stuffing box.
3. Replace all the hull anodes.
4. Replace the shock absorbing coupling on the port engine shaft.
5. Replace or have serviced the following safety equipment:
   - the battery in the lifebuoy light
   - the life raft
   - all distress flares and rockets
   - the lifejackets
6. Replace the four 125AH batteries and check the engine relay switch, repairing or replacing as needed.

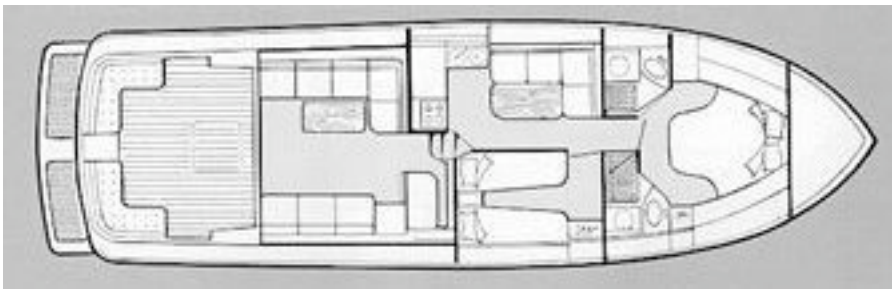
(B) Defects which should be rectified in order to prevent future problems:

7. Renew the antifouling.
8. Remove the first stanchion on the starboard side, repair the cracked gel coat and re-bed the stanchion.
9. Clean and grease the starboard tiller arm.
10. Repack both shaft glands, drawing the port shaft to check for crevice corrosion.
11. Overhaul the two inlet sea cocks serving the forward heads compartments.
12. Repair the starboard windscreen wiper motor.
13. Clean and grease all three manual bilge pump manifold valves .
14. Service automatic fire extinguishers in the engine space and generator casing .
15. Have a full service carried out on both engines .
16. Coat corroded areas on both fuel tanks with a proprietary rust converter.
17. Check the fuel indicator on the port tank when next filled.
18. Replace rusted hose clamps on both engine exhausts.
19. Swing the magnetic compass, have a deviation chart drawn and have the autopilot electronic compass checked.
20. Service or replace the flying bridge magnetic compass .

C. VESSEL DATA

Dimensions (taken from manufacturer's literature, not checked)

LENGTH OVERALL	:	14.38m
BEAM	:	4.3m
DRAFT	:	1.14m
DISPLACEMENT	:	14.0 tonnes
BUILT	:	1991 Marine Projects, Plymouth
REGISTRATION	:	[redacted] tons. (Blue registration book not seen).
HIN		[redacted]
YARD NUMBER		
FUEL CAPACITY	:	2 x 750 litre
WATER CAPACITY	:	2 x approx 500 litre
ENGINES	:	2 x Volvo TAMD71B 385hp diesels.



USE OF MOISTURE METERS

A 'Sovereign Quantum' capacitance type moisture meter which measures both shallow and deep seated moisture was used where practical to check for ingress of moisture into the GRP laminate. References to moisture meter readings throughout the text are in relation to a relative scale of 0-100, not moisture content as a percentage of dry weight.

Readings of between 0-17 are considered low and no cause for concern; 18-24 medium and 25 -100 is high and at a level where the risk of moisture related defects being present (but not necessarily physically detectable) is significant.

Whilst high moisture content (i.e. greater than 25) is not generally a structural defect in itself and should be expected in older boats, if moisture has been absorbed, the likelihood of problems occurring are higher. The actual state of the laminate cannot be completely guaranteed without destructive testing followed by chemical analysis. The opinions in this survey are based on all the evidence available at the time, but without destructive testing.

D. Hull, Deck and Structure.

D1. Keel n/a.
D2. Hull below Waterline.

The vessel was lifted and hosed off for one hour on 29 October and the underwater hull visually inspected. The condition of the anodes and stern gear are covered in section E.

Note although brief lift outs are common for brokerage sales of vessels afloat, this is not sufficient time for the vessel to be thoroughly inspected.

There was considerable growth of weed and marine organisms on the vessel indicating she has not been used or antifouled for some time. The existing antifouling has some build up, is adhering poorly and in need of replacement (B). Further cleaning will be needed before the hull can be painted.

The underwater hull is a medium to deep V design with three spray rails parallel to the chine. The underwater area was hammer sounded and visually inspected. No visible signs of osmotic blistering or delamination were found. The chines and spray rails were gently hammer sounded and no voids found. There were no visible signs of impact damage or past repairs to the chines, forefoot or other vulnerable areas. There was no deflection along the line of the keel where the vessel was held by the lifting strops.

Limited moisture meter readings were taken over the underwater hull and found to range between 10-30 shallow and 15-50 deep. Taking the lack of drying time into account, these indicate that no significant ingress of moisture into the laminate has occurred where tested.

D3. Topsides above Waterline including Rubbing Strake etc.

The topsides were inspected with the vessel ashore. There were no signs of any deformation as a result of damage or poor repairs. No evidence of cracking or hard spots were found on those areas adjacent to bulkheads. There were some minor abrasions and scratches, particularly on the port bow, but none that have penetrated the gelcoat or which warrant filling. The stem and transom corners were closely examined and no significant damage found.

The top side gelcoat is original and is beginning to show signs of UV deterioration as is the deck moulding. Wax polishing the entire vessel would both enhance its appearance and prevent further UV deterioration.

Note on the sea trial, the winch clutch became loose causing the anchor to drop. The area around the bow was checked the following day and apart from minor scuffs, no damage found.

Moisture meter readings of the topsides were between 15 and 20 both deep and shallow. Inside the chain locker, moisture readings of 25 were found and some areas of dry mat noted, but nothing significant. On the basis of this limited inspection, the topsides laminate

is believed to be in good condition at this time.

A bathing platform is fitted to the stern of the vessel (shown previous page). There is some corrosion to the fixing bolts although the structure is firm at present. The platform has teak grating which is broken on the starboard side and unable to bear weight. This needs to be fixed temporarily or permanently because the damage is not evident and it would be possible to fall through the grate in its present condition (A). A joinery workshop should be able to reconstruct the existing grate; the teak is mostly in good condition but the glue has failed.

D4. Deck Moulding.

The deck is a one piece moulding integral with the coachroof and cockpit.

Horizontal surfaces appear to be cored sandwich construction. These have a non slip moulded surface and black simulated planking lines on the deck.

The deck and coachroof was load tested, hammer sounded and checked with a moisture meter. No signs of deflection or voids were found. With the exception of a small area around the damaged stanchion (see below), the moisture meter readings on the deck and coachroof were between 15 and 20 which is satisfactory. Moisture meter readings were also taken on the underside of the deck in the chain locker forward and found to be 25 shallow, and 20 deep, again this is satisfactory.

The first stanchion on the starboard side has suffered an impact damage which has caused the surrounding gelcoat to crack as shown. Moisture meter readings show that water has permeated into the underlying laminate and core of the deck sandwich.

This needs to be addressed to prevent further deterioration by removing and re-bedding the stanchion and filling the cracked area (B).

Minor crazing was noted to starboard of the stemhead fitting but with no consequent high moisture content.

Overall the deck moulding is considered in good condition at this time.

D5. Coachroof.

Horizontal and vertical surfaces of the coachroof were visually inspected and tested with a moisture meter. Readings were between 15 -20 which are satisfactory. Minor crazing was noted above the port navigation light and the starboard flying bridge handrail but no consequent ingress of moisture found.

The flying bridge consol is a separate moulding bolted to the coachroof. This is of thinner construction and has crazing along the forward edge (shown). Moisture meter readings were around 20 in this area which shows there has only been limited ingress of moisture into the laminate. The dirt in the crazing can be removed with detergent followed by wax polish.

The flying bridge has a tinted perspex windscreen which is slightly crazed.

D6. Cockpit.

The cockpit sole and coaming was hammer sounded and tested with a moisture meter. No visible damage or evidence of voids were found. Moisture meter readings were low (15 deep and shallow).

A teak overlay covers the cockpit floor. This is in very good condition, shows no signs of wear or moisture absorption and has a black sikaflex caulk which is well bonded to the seams. The brokers state this was replaced in 2000.

There are moulded benches with lockers under around the aft edge of the cockpit. These open smoothly and are in good condition. The vinyl upholstery is in reasonable condition.

D7. Hull/Deck Join.

The deck moulding overlaps the hull edge in a joint which is glassed over on the inside. The join was inspected in the chain locker and the stern compartment and appeared well made and sound where accessible .

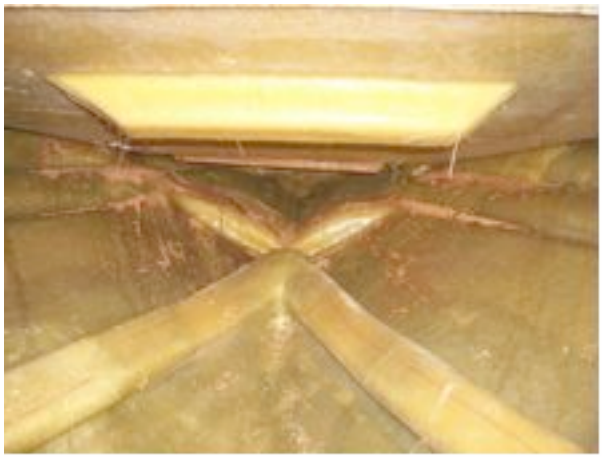
A rubbing strake covers the join externally. There is some seepage of water from filler beneath the join on the starboard aft quarter. This should be replaced as part of normal annual maintenance.

The rubbing strake is stainless steel with a rubber insert. The insert has come loose about 2m forward of the transom on the port side. It should be possible to refit this using a soft mallet.

D8. Bulkheads and Structural Stiffening including Internal Mouldings.

The hull is a single skin polyester resin laminate using chop strand mat and woven ravings. The resins are probably isophthalic which came into widespread use after 1990 and are more moisture resistant than the previously used orthophalic resins. The hull is strengthened by a series of bulkheads, half bulkheads and longitudinal cored stringers, all of which are bonded into the laminate. The engine bearers are cored square sections which form part of the overall structure.

There are three deck to keel bulkheads; aft of the two heads compartments and at the fore and after end of the engine compartment. All are cored fiberglass with oak plywood facing in the accommodation areas.



These were inspected and hammer sounded where accessible and found to be well bonded and secure. Half bulkheads which support the cabin sole are at approx 0.7m intervals, again these were found secure where accessible.

There are longitudinal fore and aft foam cored bearers either side of the centerline. Where accessible these were found to be well bonded and secure. The photos shows the structure beneath the master cabin double bunk which is particularly prone to damage from wave pounding.

None was seen in this case. There are also various internal mouldings which form bunk tops and heads compartments which are bonded into the hull structure.

E. Steering, Stern Gear, and Skin Fittings etc.

E1. Rudder and Steering.

The vessel has paired, scimitar profile, bronze rudders. These are controlled from steering positions in the wheelhouse and on the flying bridge. Both connect to a single hydraulic ram in the stern compartment. The hydraulic system has a small reservoir on the bulkhead above the starboard tiller. This is clean and up to level. The ram connects to the starboard tiller which has a bar connection to the port tiller. An electronic helm indicator is connected to the port tiller arm.

The port tiller appears to have been recently replaced or refurbished. The starboard tiller shows signs of corrosion around its head (shown above) and should be cleaned and greased (B).

The steering was tested from lock to lock and found to have 4½ turns. Both wheels are secure and turn smoothly. No signs of hydraulic oil leakage were seen in the stern compartment.

Both rudder bearings were inspected outside the vessel. The port rudder was found to be firm and the starboard had minimal play within acceptable limits.

An emergency hand steering tiller is clipped to a half bulkhead at the stern of the aft compartment. This is becoming corroded and should be repainted.

E2. Stern Gear.

The vessel has contra-rotating propellers, 23” diameter x 27” pitch, believed to be ‘Aquapoise’ types. The port propeller (left below) has de-zincified to the point it needs replacing - it has severe surface corrosion and will now be unbalanced (A) . The starboard

propeller was inspected closely with a magnifying glass after removing oxidization from the blades. No signs of visible defect could be found, but in the absence of any anodes (see section E3 below), it will also rapidly de-zincify to the point that it needs replacement.

Both propellers were hammer sounded and found firm on their shaft tapers. Both are secured with crown nut and split pin. Given the corrosion already found, it would be advisable to replace these items on both propellers (A).

The shafts are 'Aqua-met'. These were lifted to test for play within the P bracket bearings. None was noted on the port shaft and only slight play, within normal limits, on the starboard.

The P brackets are bronze and securely attached to the hull. They were scraped and hammer sounded and no signs of corrosion found. Note these will be silicon bronze or similar and consequently less prone to galvanic corrosion than the propellers which are manganese bronze.

There are polyurethane couplings between the engine and gearbox which are fitted to absorb impact damage . The one on the port engine is cracked in two places (shown) and should be replaced (A).

The starboard coupling is satisfactory.

The shafts pass through the hull into moulded stern tubes via stuffing boxes which are water cooled. The port box was slightly dripping before the sea trial and rapidly dripping afterwards (shown). The starboard one developed a slow drip. Both need repacking (B).

Corrosion can be seen around the shaft on the port stuffing box and this may indicate hidden crevice corrosion damage. It would be advisable to check this when the propellor is replaced (B).

The vessel has twin trim tabs controlled from the helm position. These were tested during the sea trials and found in working order.

E3. Cathodic Protection.

THE VESSEL'S CATHODIC PROTECTION SYSTEM IS IN URGENT NEED OF REPAIR._ There should be two anodes secured to through hull studs on 200mm centres outboard of each propeller shaft. Both are completely eroded. There should also be two anodes secured to the trim tabs with bolts at 80 mm centres. Again both are completely eroded. This has already caused the port side propeller to de-zincify to the point it needs replacement. This should be addressed immediately as there is a risk that the through hull studs will erode and cause a major leak (A). There is also a risk that other parts of the stern gear and steering assembly will be damaged in the near future. Note the studs were hammer sounded and found secure at present.

The anodes can be replaced with MacDuff type ZD72B (specify 200mm centres when ordering) for the hull and ZD76 for the trim tabs.

E4. Skin Fittings and other through Hull Apertures.

The following through hull skin fittings were examined from inside and outside the vessel. All were hammer tested externally and where present, valves opened and closed to their fullest extent, connecting hoses checked for security and hose clips checked for corrosion and security.

i. There are two bronze seawater inlets to starboard serving the forward heads compartments. The inboard valves for these are corroded and the handles extremely stiff as a result of leakage (shown) . It is recommended they be removed and overhauled when the vessel is next ashore (B).

ii. Two bronze outlet skin fittings to port from the heads compartments, both satisfactory although the ball valve handles are slightly stiff and need greasing.

iii. Two bronze gridded engine seawater intakes port and starboard with large capacity ball valves inboard, both satisfactory.

iv. A paddlewheel log starboard side amidships. This spins freely and is secure.

v. A depth sounder transducer port amidships which is secure. A redundant transducer fitting alongside is also secure. Note good practice is to secure plastic through hulls with a fillet of epoxy paste around the fitting.

vi. An electrical grounding plate starboard amidships. Secure.

Both engine and generator exhausts discharge are through port and starboard moulded fiberglass fittings which can be accessed in the stern compartment. These mouldings were hammer sounded and found secure but note separate comments on corrosion to the exhaust hose clips.

In addition to the above there are six nylon through hull skin fittings above the water line to port and four to starboard. These were visually inspected, lightly hammer sounded and all found in good order

F. **Deck fittings.**

F1. Main Companionway and other Accesses to Accommodation.

The accommodation is accessed through glazed sliding doors at the aft end of wheelhouse. These slide and lock smoothly.

F2. Ports Windows etc.

The wheelhouse has three split fixed safety glass windows forward, and single split sliding windows port and starboard. All have internal and external stainless steel frames and rubber gaskets in good condition. There is no sign of any leakage in the forward windows. There is minor corrosion to the base of the sliding side windows which can be addressed by cleaning and light oiling. These operate and lock smoothly.

There are electric wipers to the forward wheelhouse windows, controlled from the helm position. The port and midships wipers work, the starboard (in front of the helm) does not and its motor or supply circuit needs repair (B).

The windows have a screen wash system which was tested and seen working.

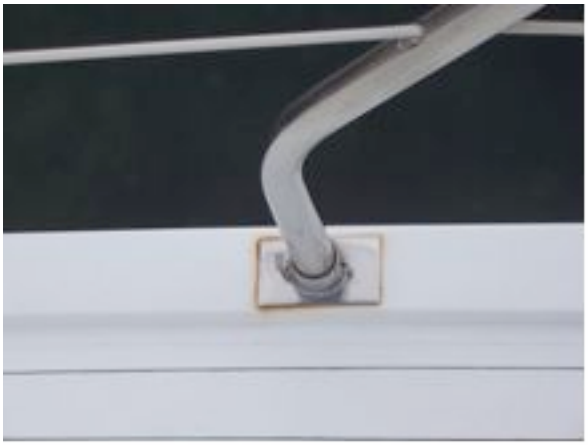
There are four opening ports in the hull topsides. All have stainless steel frames, rubber seals and perspex glazing. All are in good condition with no signs of leaks. Some of the catches are stiff from lack of use; these are in the starboard heads compartment and the starboard side of the main cabin and the forward port over the lower saloon table which is completely seized.

A hinged locking Lewmar hatch is fitted over the double bunk in the main cabin. This opens smoothly, locks securely and its seals are in good condition with no signs of leakage. The smoked perspex glass is crazed.

F3. Pulpit, Stanchions, Pushpit, Lifelines and Jackstays.

The pulpit is welded stainless steel tubing, firmly attached but of flimsy design. The weld quality is poor with some signs of corrosion.

There are six stainless steel stanchions with a welded top rail and plastic covered stainless wire lower rail. The wire has chafed through its coating and shows signs of corrosion on the port side. It will need replacing in due course. Two of the stanchions (starboard aft and first forward port) have crevice corrosion at their base (shown). These should be removed, cleaned and re-bedded to prevent further corrosion.



Two handrails are mounted each side of the coachroof. Both are well secured and in good condition.

F4. Rigging Attachment Points n/a.

F5. Ground Tackle and Mooring Arrangements.

The vessel is fitted with a self-stowin, stem roller, mounted 15 kg Delta type anchor which is corroded but serviceable (brokers details specify the vessel is equipped with a 35 kg anchor which may be an error). The stemhead roller fitting is stainless steel, well secured and in good condition The chain is 10 mm galvanized and rusted where it has laid on deck, in good condition otherwise. Stowage is at the stem of the vessel which can be accessed through the forward cabin bulkhead mirror which has a hinge and clip

arrangement. The clips are very stiff. The chain end is shackled to a ringbolt. It would be better to have a weak line link here that can be cut in a hurry.

There is an electric 'Loftans' winch which is controlled from the wheelhouse and flying bridge helm positions. This was tested from both positions and found to work satisfactorily. There is no means of manually operating the winch. The winch has a clutch to allow the anchor to be lowered without power. Note this came loose during the sea trial and need to be well tightened using the pump handle or similar as a lever.

No kedge anchor was found on board. The Delta type anchor currently fitted is the manufacturers minimum recommended weight for this size of vessel and about half that acceptable to the MCA if the vessel were used for charter. Given this and its corrosion, it would be prudent to replace it with a 30 kg model, keeping the current anchor as a kedge.

There are six, 300mm base, through bolted aluminium mooring cleats on deck, paired forward, midships and aft. All are well secured and in good condition. There are paired roller fairleads at the bow and stern, again well secured and in good condition.

F6. Other Deck Gear and Fittings.

There are six circular vents in the coachroof with small perspex lights. All are secure although the perspex is UV degraded.

The vinyl cushions on the flying bridge seating are cracked as a result of UV damage.

There is a blue synthetic canvas canopy with flexible plastic windows over the entire cockpit. This has zipped side and stern access panels. The zip on the starboard forward panel is broken. Others are stiff and need lubricating. There are some small cracks to the window plastic. The canvas and its stitching is in fair condition.

F7. Davits and Boarding Ladders.

There are paired stainless steel davits at the transom. Both are firm and secure. The winch handles lift but the release catch to unwind the cable needs lubricating.

A fold down boarding ladder attaches to the stern platform. This is secure and in good condition. A portable swim ladder can be attached to deck mountings port and starboard of the cockpit.

G. **Rig n/a.**

H. **Safety.**
H1. Navigation Lights.

There are port and starboard running lights on the wheelhouse sides, a forward steaming light on the flying bridge gantry and a stern light. All are vertical filament bulbs and appear to be 25w size. All were seen working. They comply with current international Collision Regulations. There is also a 10w white all round anchor light on the gantry.

H2. Bilge Pumping Arrangements.

The vessel is divided into three bilge compartments; the forward cabin, the engine space, and the stern compartment. Each has its own electric bilge pump and float switch. The pumps can also be directly controlled from the helm position. All three pumps were tested and found in working order.

A Whale 'Gusher 10' manual bilge pump is fitted in the starboard cockpit locker (shown). The pump was tested and appeared in working order. Three gate valves alongside allow suction to be isolated to the three compartments. These valves were stiff to operate and need greasing (B). Note the pump will not work if it is able to draw air from a dry compartment.

H3. Firefighting Equipment.

There are two 5A-34B 1kg dry powder fire extinguishers, the first located by the helm and the second in the main cabin. Both are up to pressure. They expire at the end of 2008.

The engine compartment has a fixed 4B-360 5kg Halon substitute automatic fire extinguisher mounted on the deck head. It is up to pressure. Although this appears new, the installation and servicing tag has not been filled out. It can be activated from the wheelhouse or the flying bridge. The generator housing has a similar unit, 1 kg size, which has no installation or servicing tag . It would be advisable to have both units checked (B).

H4. Lifesaving and Emergency Equipment.

A horseshoe buoy is mounted aft of the flying bridge. The battery in the attached floating light is dead and should be replaced (A). This or a further buoy would be better placed in the cockpit.

A 'Zodiac' valise liferaft is stowed in the stern compartment. Brokers details state it was overhauled in 2004. There are no service stickers or labels to confirm this and in any case it will be due for a service or replacement by now (A). It would be better stowed in the cockpit or flying bridge lockers.

There are various parachute rockets and red flares, all expired end 2006, in a container in the forward port cockpit locker. All need replacing (A).

There are 6 auto inflating lifejackets and 4 buoyancy aids in the opposite starboard locker. All appear in fair or good condition, but again will probably need servicing (A)

I. <u>Engine.</u>

I1. Engine and Installation.

The vessel has twin turbocharged Volvo TAMD71B 385hp diesels fitted with hydraulic gearboxes and shaft drives. The dashboard hour counters show 54.1 for the port engine and 55.9 for the starboard. A note on the dashboard states both have an additional 241 hours, making 297 in total. This is very low for a 17 year old boat. Both engines were checked before and after the sea trial carried out on the first day of the survey.

No service records were available on the days of the survey, although I understand the broker has these.

The engine space is generally clean and well maintained. There were no signs of excessive corrosion on either engine or its components other than where described in the text below. The compartment is dry and well ventilated.

Engine and gearbox oils were checked and found up to level on both engines. A label on the dipsticks states engine oils were last changed in April 2006.

The secondary cooling water was up to level on the starboard engine header tank and low on the port engine. The primary cooling water system has large accessible glass filters for each engine.

Oil and fuel filters were labeled as being changed in 2006.

The hydraulic gearbox oil was checked and found up to level and clean on both dipsticks.

Both engines have toothed alternator belts driven from the flywheel. These were checked after the sea trial and found loose, especially the port. Both belts are in poor condition with signs of wear and cracking.

The engines were tested over two hours on the first day of the survey. Both started readily when leaving the mooring. Starting problems after the re-launch were probably due to low battery power (see section J5). Although there was some initial smoking at tick-over, this is to be expected given the vessel has not been used for some time. When finally tied up at the end of the trial, both engines were seen ticking over smoothly with minimal smoke from the exhaust.

The engine indicators were observed at the upper and lower helm positions during the sea trial. Both engines gradually reached a 150°f operating temperature which is slightly lower than the manufacturers specification of 167 to 203°f. Both remain steady at that level throughout the trial.

Both engine oil pressures rose to 70psi and remained steady at this level throughout the trial. The manufacturers minimum is 61psi.

The vessel attained a steady speed of 25 knots at 2000 rpm.

At the end of the sea trial when manouvering at low revs, the port engine warning indicators for temperature and oil flickered on and off.

Taking all the above into account, the engines appear in good working order at this time but are in need of a full service (B).

The engine compartment has a forced air ventilation system which is operated manually from the helm position. This was checked and found in working order.

The exhausts on both engines have new injection bends which are in good order. These connect to flexible piping, then a short angled steel section and then a further flexible section which connects to the exhaust outlet which is moulded into the hull below the waterline.

All of the hose clips aft of the injection bends on both engines are corroded and in poor condition (example shows port, others similar). Additionally the clamps to the exhaust outlet are also in poor condition. All of these should be replaced (B).

The engine compartment deck head, bulkheads and fuel tanks are lined with an open cell sound deadening foam. This is adhering well to its substrate. A small sample was removed from boat, flame tested and found to be fire resistant.

The engine is secured to square section bearers by resilient mounts. These were inspected where accessible and appeared firm, free of corrosion or other damage.

I2. Fuel System.

There are two 786lt mild steel fuel tanks strapped to wood bearers outboard of each engine. It was only possible to carry out a limited inspection of the top of both tanks using access hatches beneath the wheelhouse settees and a very limited inspection of their base using a digital camera and mirror in the engine space. The inboard sides and ends could not be inspected owing to glued sound insulation. The outboard sides are tight to the hull.

This showed that both tanks were badly corroded on their top surfaces where visible, with rust flaking off as a result of light scraping as shown. On those parts of the sides and base that were visible, surface rust could be seen (photo below). The inboard corner welds appeared relatively sound (photo below). There was no obvious signs of fuel leakage from either tank.

The use of mild steel fuel tanks is a design fault with all Princess yachts and I have seen situations where the tanks had to be condemned due to rusting on the corner welds. This was not evident in this case. Note replacing the tanks is a major repair which involves removing both engines. I contacted the builders for advice, including possible spray coatings which might be applied in situ, the thickness of the tanks and any information on typical longevity. They replied with a copy of the manufacturers drawings (annexed) which appear to show the tanks are 3mm steel. Consequently you should take into account the risk of having to replace these tanks in the near future . It is possible to have the tanks pressure tested but, beyond advancing any incipient failure, this will not tell you anything about their potential lifespan. You might also consider removing accessible flake rust and spraying as much of the tanks as possible with a rust converter product suitable for marine use such as ‘Vactan’ or ‘Navy Steel’ (B).

The fuel system has fixed copper piping from the tanks to paired water separators via three shut off cocks operated from the port cockpit locker (port and starboard main engines plus generator) These operate smoothly. The separators are securely mounted on the aft engine bulkhead and appear clean with no build up of dirt or water. The line then runs to the

engine with copper and flexible piping. The latter is marked to the correct ISO 7840 standard and is in good condition.

The fuel tanks have two capacity indicators at the helm position. The needle for the port tank indicator appeared to move erratically during the sea trial. This may be due to low fuel levels so should be checked again when the tanks are next filled (B).

J. Accommodation and on Board Systems.

J1. Accommodation General.

The accommodation comprises a master cabin forward with a double bunk and ensuite shower and heads compartment, a guest cabin to starboard, galley and saloon area to port, and the wheelhouse which has a further seating area. Joinery throughout the boat is finished in oak veneered plywood, is to a high standard and its finish has been maintained to a reasonable condition. Other surfaces are lined with cream vinyl which is in good condition with no signs of sagging. The carpets are a good condition. The wheelhouse and saloon settees are in maroon leather and in good condition but can not be secured at sea. The wheelhouse curtains are in poor condition. External upholstery is in reasonable condition apart from that on the flybridge which is damaged and cracked by UV degradation.

There are two CD player and radio receivers in the wheelhouse, both in working order. External speakers on the flying bridge are mounted into the gantry and shows signs of rusting. A wheelhouse TV and video system is in working order.

J2. Gas Installation. None.

J3. Fresh Water Tanks and Delivery.

There are two aluminium water tanks at the forward end of the stern compartment, each approximately 500lt capacity. A pressurized system delivers water to the galley and the two heads compartments. All taps were checked and found working satisfactorily. The pressure system accumulator is mounted in the stern compartment and appeared in good condition with no leak from its rubber diaphragm.

A calorifier is securely mounted at the aft of the engine compartment. This also has an immersion heater which was tested and found working.

There is a water tank level indicator in the galley which was seen working.

J4. Heads.

There are two electrically operated sea toilets in the forepart part of the vessel. Both are securely mounted. Both were tested and found in working order.

J5. Electrical Installation.

The vessel has a 24v electrical system which is supplied by a bank of six 12v batteries arranged in three parallel wired rows. These are accessed through a panel at the after end of the guest cabin which also contains a 40w charger. This was heard working. Four of the batterys are 125 AH lead acid of unknown manufacture, and two are 108 AH 'Vetus' sealed units.

The batteries were disconnected from the charger, a light load applied for 10 minutes and then checked with a volt meter and a hydrometer. Three of the four 125 AH batteries failed to hold a charge, dropping from 13.5v under charge to 5v, 7v and 10v. Individual cells were checked at random on each battery and several found to be empty. The previous day the owner had, during the sea trial, filled some of cells but not others. Those that were full had a SG of between 1.2 and 1.25 indicating a 50% to 75% charge (fully charged would be

1.3). The Vetus batteries appeared to hold their 13.5v charge during the test. Consequently it is recommended that all four of the 125AH batteries be replaced since it is likely that all will have suffered irreversible damage to their plates as a result of lack of maintenance (A).

The vessel has a Westerbeke 6Kva 240v generator which is mounted in a sound proof casing in the stern compartment. It has its own starting battery which was found discharged on the first day of survey but appeared to hold an overnight charge. The engine was started (controlled from the switch panel) and ran smoothly. Its oil and water were checked and found up to level.

Electric lights were tested and used throughout the vessel during the survey and all found in working order.

The main switch panel is below the helm position. All switches and indicator lights were tested and seen working apart from the battery isolators described below. Charge and voltage indicators were all seen working.

The vessels electrical system is isolated by two relay switches on the main switch panel. These control solenoids that connect the domestic power and engine starting circuits to the common battery bank. It was noted on re-launch for the sea trial that the solenoid for the engine starting circuit was prone to jam in the off position. This should be inspected in conjunction with the replacement of the batteries above to see if the fault is a result of low charge or the need for overhaul or replacement(A).

J6. Electronic and Navigation Equipment.

A Raytheon radar set is mounted to port of the helm with an open scanner on the gantry. This was switched on at sea and seen working. The gantry is well secured.

A set track chart plotter and autopilot is mounted to the left of the helm position. This was seen in working order during a sea trial although there appeared to be a 40° discrepancy between the electric compass used by the plotter (mounted under the bunk in the guest cabin) and the magnetic compass over the helm. Given numerous electronic devices have been installed in the boat since manufacture, it would be advisable to swing the magnetic compass, have a deviation chart drawn up and have the autopilot electronic compass checked (B).

Helm position magnetic compass appeared in good working order with no cracks in the glass or bubbles in its fluid. The flying bridge magnetic compass has a large bubble in the fluid and needs servicing or replacing (B)

An ICOM GMDSS VHF radio is mounted above left of the helm position. This was seen to transmit and receive satisfactorily. There is also an ICOM VHF radio on the flying bridge.

There are twin whip VHF aerials secured to the gantry. Both are secure and in good condition.

The VHF licence expired in November 2007 (these are now free from 'Ofcom').

A 'Cetrek' GPS, depth sounder and log are mounted above the helm position. There is also a separate Lowrance GPS plotter. All were seen in working order during the sea trial

A barometer, tide clock and chronometer are mounted at the centre of the wheelhouse. The chronometer was not working.

J7. Heating and refrigeration.

There is no installed heating system on the vessel. There are free standing domestic 240v mains fan heaters and dehumidifiers on the vessel.

The galley has 240.microwave and a four ring electric hob. The microwave was tested and found in good working order. The hob has touch switches which initially worked intermittently. With use they appeared to work normally.

There are two refrigerators, one in the wheelhouse aft of the helm and a larger in the galley. Both were switched on and heard working (the switches are high up inside the cabinet and not immediately obvious). Both fridges are mouldy and need cleaning.

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