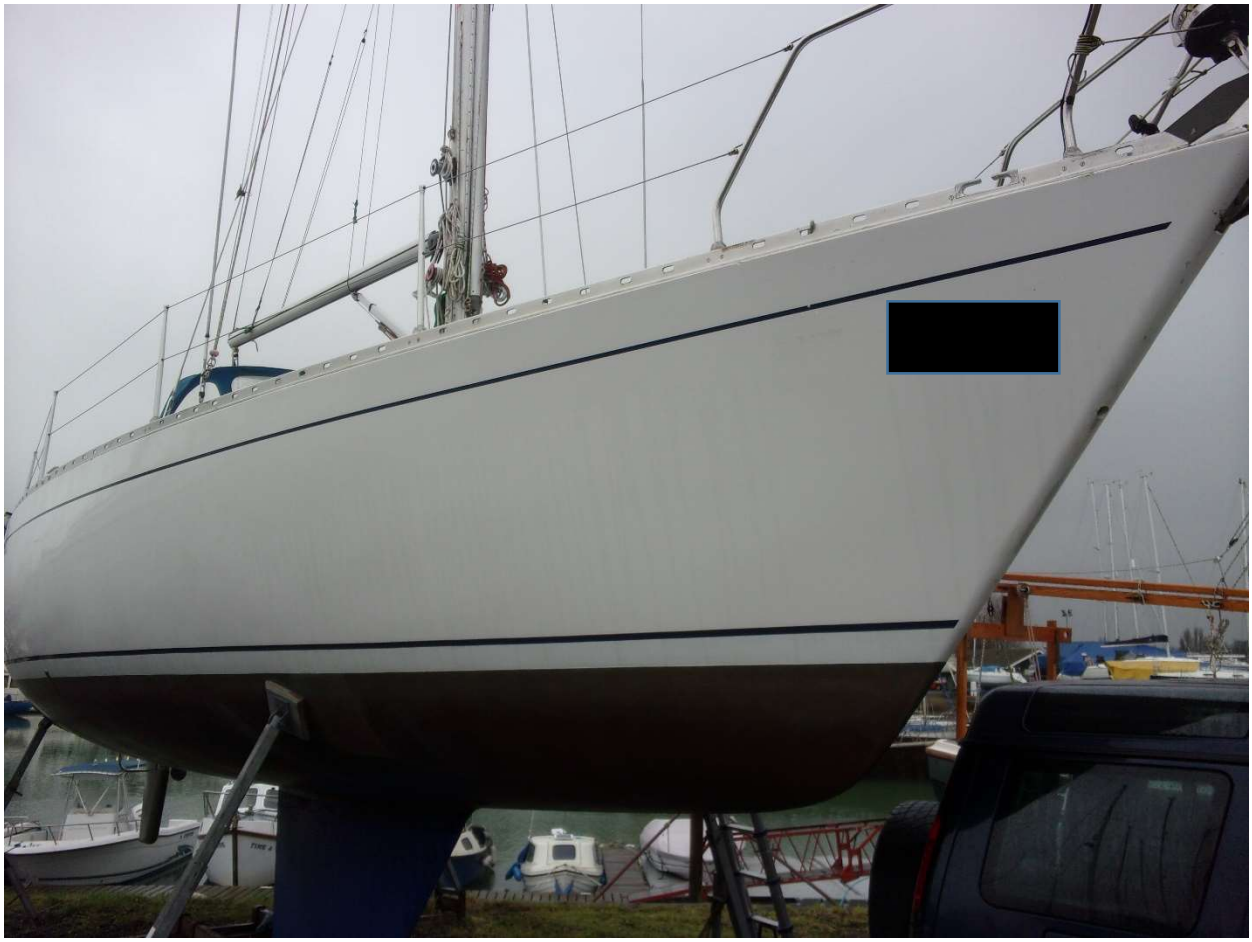
MEDUSA
MARINE

Pre-purchase full condition survey report on:
Moody 34 [redacted]



For:
Mr [redacted]

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The Royal Institution of Naval Architects

UK Ship Register
Tonnage Measurer

Pre-purchase Full Condition Survey Report on Yacht [redacted]

This survey was carried out on the 5th February 2016 on the instructions of:

[redacted]

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1) General notes.

a) Responsibility

Any responsibility is to the above client only and their insurers, and not to any subsequent owner of the vessel under survey or holder of this report. Copyright is retained by Medusa Marine and copies must not be made or distributed without specific permission of the copyright holder.

b) Location

The vessel was laid up ashore at [redacted] on the 5th February 2016

c) Purpose and scope of survey

Survey was carried out under Medusa Marine terms and conditions. These are YDSA standard terms of engagement and are available on our website www.medusamarine.co.uk/index.php/terms-andconditions/
The survey was commissioned by the purchaser for establishing the condition of the vessel prior to completion of purchase. Unless otherwise stated, the vessel was not surveyed for compliance with any build standards (RCD) or operational codes of practice or local licenses. The vessel has also not been surveyed for suitability for any particular purpose or location. This survey report is a factual statement of the surveyor's examination as carried out and his opinion given in good faith as to the relevance of disclosed facts and defects so far as seen. It implies no guarantee against faulty design or latent defects.

d) Limitations

Areas inspected were limited to openings and access available during normal operations and maintenance of the vessel. No fastenings or skin fittings were removed, keel bolts drawn or joinery or head linings removed. Closed compartments were visually inspected by means of a Ridgid CA100 endoscopic camera. Materials used in the construction were tested as far as was possible by industry standard Non Destructive Test (NDT) test equipment.

Unless the vessel was afloat, the mechanical condition of the engine was not covered by survey, only the installation and components normally available to routine maintenance could be assessed. If afloat, only assessment of the engines no load running condition was possible. Sails where present, were examined for general condition. The sails were not set, so no assessment of shape or stretch could be made. Spars where stepped were examined from deck and ashore only.

Navigational equipment, electrical installations and domestic appliances were assessed subject to limitations if battery charge or shore power was available. If

there was no opportunity for sea trialling the vessel, no assessment of the vessel and her equipment under seaway conditions was possible. No opinion could be made or responsibility undertaken for condition or defect of those aspects of the vessel not accessible or evident due to the above limitations.

e) Recommendations

Recommendations have been subdivided into three categories. All recommendations are annotated thus and are summarised at the end of the report

Category 1 (Cat 1) are safety and seaworthy related defects which should be corrected before the vessel is put into commission.

Category 2 (Cat 2) recommendations relate to defects which affect the operation of the vessel in normal use and should be attended to at the earliest opportunity. They do not however, affect the safe operation of the vessel.

Category 3 (Cat 3) recommendations relate to conditions which are cosmetic or may affect the perceived value of the vessel and can be attended to at the owner's discretion

2) The Vessel specifications and description

Note: Dimensions and measurements given have been derived from manufacturers published data, they have not been verified by survey.

Dimensions: LOA:	10.19 metres
LWL:	8.46 metres
Beam:	3.56 metres
Draft	1.52 metres
Displacement: (light)	5.080 tonnes
Ballast	2.041 tonnes
Builders:	Marine Projects Ltd for A H Moody & Sons
Model or Type:	Moody 34
Year	1983
Designer:	Bill Dixon
Lloyds HCC No.	PLY[redacted]
Registration	SSR [redacted]
Construction:	GRP Hull and deck
Engines:	Volvo Penta 2003
Sail area (main)	21.74 sq metres
Sail area (100% foresail)	26.35 sq metres

This vessel was built before the 16th June1998 and therefore is not subject to the requirements of the Recreational Craft Regulations (SI 1996/1353) and not the 2005 (Directive 2003/44/EC) which include environmental emission limits.

Vessels that have evidence that they were in use as private pleasure craft prior to 1 January 1985 and were in the EU on 31 December 1992 are deemed VAT paid. Provided evidence can be provided that the vessel was delivered new within the EU no evidence of VAT paid status is needed.

John Moody started building his first fishing boat in his back yard at Swanwick in 1823. Eventually the boatbuilding firm of A H Moody and Sons was formally incorporated by his son Alexander in 1870 and continued to build fishing boats until 1934 when it built its first yacht. This was a bespoke yacht builders and gained a high reputation for traditionally built one-off custom yachts.

In 1972 the first production GRP yachts were produced with manufacture subcontracted to Marine Projects of Plymouth who also built the Princess and Sigma ranges. These were designed by Angus Primrose. Bill Dixon was the senior designer at the Primrose design office and when Angus Primrose was lost at sea in 1980 Dixon took over the design work for Moody.

The Moody 34 was Bill Dixons fourth design for Moody's and it was introduced in 1983. [redacted] was built in the first year of production. The Lloyds hull number marked on the transom indicates that it was inspected by the Plymouth office of Lloyds in 1983 and so is an early model.

165 vessels were built by the time production ended in 1986. The model was replaced by the Moody 346 which is only a minor development of the original moulds with a drawn out transom and detail changes to the fit-out. Another 254 were built until the model was phased out in 1990.

The design is of a relatively modest displacement hull with undistorted lines. The raked stem and gentle sheerline with moderate flare gives way to a firm round bilged hull form and a slightly retrouseé transom. The keel is a shallow iron fin bolted to a short moulded stub. The broad waterline beam and firm bilges will give good initial form stability, however the shallow keel means the yacht would benefit from being reefed early. The Moody 34 is a yacht which is designed for comfort rather than performance.

The masthead rig has single in-line spreaders. The rig is simple with cap and fore and aft lower shrouds pinned to separate chainplates, and single standing fore and back stays and a baby stay. The mast is stepped on the coachroof with a compression post beneath. Sail area is roughly evenly distributed between the head and main sails which allows for easier sail handling and lighter loads.

There is single line slab reefing for the mainsail with lazyjacks, and furling gear for the genoa. The sail wardrobe includes a spinnaker and a track mounted pole to the mast. All lines are led back to the cockpit and the whole is engineered for easy short-handed sailing.

The accommodation provides for up to six berths, with two double sleeping cabins separate from the main accommodation. In the fore cabin is a traditional 'V' berth with an infill and a hanging locker under bunk stowage compartments. There is an opening hatch to the foredeck. In the saloon a settee berth and a U shaped dinette are set either side of a fixed drop leaf table with fiddles.

Aft of the saloon to port is a chart table with galley opposite. The galley has a two burner gimbaled gas cooker with a grill an oven, twin stainless steel sinks with hot and cold pressurized water supplied and a refrigerator.

A separate heads compartment to port features a marine toilet with a shower and washbasin. To starboard a low companionway under the coamings gives access to a large full width aft cabin. This features a double berth, a seating area and a hanging locker. The cockpit is a good size and deep and is self-draining with wheel steering and full depth lockers under the port seating.

The engine is located under the companionway, and drives through a shaft held in a P bracket. There is good access for engine servicing in the companionway through to the aft cabin. The rudder is skeg hung with substantial bronze hangings and nylon bearings.

a) Hull general

This hull would have been built before the time when the problems associated with moisture absorption into permeable resins and laminates were fully understood. According to the manufacturer's data, the hull construction is of solid hand laid-up isophthalic and orthothalic polyester resins and gel coats.

The hull is moulded in two halves to allow for moulding the tumblehome and the rudder skeg. The two hull halves are laminated together with a third part, the transom moulding laminated in finally. The hull is stiffened by longitudinal foam cored stringers which also provide support for the bunk bases. The bulkheads are also fully bonded to the hull providing additional strength. Web frames in the form of partial bulkheads provide an anchorage point for the chain plates. A matrix of transverse members comprising laminated over hardwood floors provides stiffening and strength to the keel stub. The forward most gives a base to the mast compression post.

b) Bottom and Keel

The bottom is finished with a copper powder filled epoxy coating such as Coppercoat or Copperbot. It is understood that this was applied in 2014. It is a well adhered coating but needs lightly abrading to expose the copper. This will oxidise to form the copper oxide which is the active bactericide. This should be

done every year until the coating is exhausted which should be expected to last between seven and ten years.

Some antifouling coatings with high metallic components and water retention can affect moisture readings. The antifoulings extended about 8 cms above the waterline, so readings were taken for reference on the topsides and through the coating above the waterline. The above waterline readings were about two points lower than though the coatings. All following reading were taken through the coatings, but need to be adjusted down slightly to compensate for the coating. With this kind of permanent coating it is necessary to avoid removing it for true non-destructive testing.

Moisture readings were taken with a Sovereign Quantum Marine Moisture meter. This meter is a capacitance type tester and is equipped with both deep and shallow reading scales. This is useful to trace the depth of penetration of, and correspondingly the drying out of moisture. All polyester laminates will absorb some moisture to a degree without it effecting the structure or strength of the construction.

The comparative scale is 0 to 100, which is an arbitrary scale, and does not represent actual percentages of moisture in GRP. Thus figures are thus quoted as scale readings and not as percentages.

Representative readings on a Sovereign Quantum comparative scale for moisture content in GRP laminates approximate as follows:

0-15 Regular readings for a ‘dry’ GRP laminate
16-20 Slight absorption typical of permeability of weather exposed GRP
20-30 Medium moisture content, could be osmotic but unlikely to blister
31-45 High moisture, osmotic process but not necessarily physical effects
46-60 Very high, usually physical effects, blistering and wicking evident
61-100 Extreme saturation moisture with a visible structural defects

The atmospheric conditions at the time of survey were as follows:

Weather:	Cloud and occasional light rain
Wind:	SW 15/16 knts
Air temperature:	10.9°c
Hull surface temperature:	9.4°c port 9.3°c stbd
Relative Humidity:	84.1%
Dew point:	7.7°c
Hull temp over dew point	1.6°c to 1.7°c

It is usually considered necessary for the hull temperature to be at least 5° above the dew point for moisture readings to be representative. This would only be an issue if the hull readings were seen to be at a worrying level.

General readings were taken in the topsides and showed a variable level of 12 deep and 17 shallow scale. Readings were taken in the copper antifoul above the waterline and showed readings of 14 deep and 19 shallow scale. It was thus seen that the coating was adding 2 on the comparative scale. All the following readings can be discounted by about that figure for true representation of moisture content.

The area below the waterline ranged from 13 to 25 at the deep scale readings and 17 to 26 on the shallow scale. Examination direct to the laminate where accessible internally showed similar readings after discounting the influence of the Copper antifoul. The condition of the hull bottom was considered to be satisfactorily dry. A regular cycle of lifting and drying the vessel for at least two months every season will allow retained moisture to dissipate. The epoxy in the coating will not affect the ability of retained moisture to dissipate. The epoxy resins used as a binder is solvent based, so it is not impermeable to moisture transmission. *(See explanatory note 1).*

The hull was also extensively hammer tested over the whole area. No signs of delamination or voids were evident. There were also no signs of blistering or deformities in the uniform hull bottom profile. The hull bottom was also seen from different viewpoints and no distortions or deflections could be observed. The rudder skeg is integral with the hull moulding and not a grafted on extension. The moisture readings were low to moderate and consistent with the remainder of the hull.

The keel is a one piece iron casting bolted to the moulded stub by 25mm stainless steel studs with small square 5mm thick stainless steel backing plates. The landing seam is flat and the casting is in good condition and lies fair to the hull. The landing seam is bonded and sealed with a high modulus polysulphide sealant. This is apparently well sealed. There are no tracking stains of retained water from the seam but these could have been overpainted since the vessel was lifted.

The keel fastenings would have originally been in mild steel. These are very prone to corrosion as the fastenings sit in the keel stub which effectively forms a bilge water sump. There was water in the sump at the time of survey which is believed to have originated in the engine space. The stainless steel fastenings are a recent replacement and are in good condition.

Replacing mild steel fastenings with stainless steel is not a direct equivalency. Mild steel is more ductile and more capable of absorbing stress loading. Its breaking strain is over 50% greater that of stainless steel of a similar section. The wide landing seam and shallow keel means the stainless steel fasteners are still well within their design limits. This is a regular and proven modification on this model.

The forward most transverse keel floor carries the mast compression post. This keel floor is significantly compressed in the upper part with the plate welded to the end of the compression post being bent into a curve. The floor is a hardwood core laminated over with GRP laminates and bonded to the hull.

This sits in the keel sump and would be saturated with bilge water as the limber hole passes through at the bottom and does not appear to be sealed from the ingress of bilge water. The laminates are fractured and when measured for moisture the hardwood core showed a saturation over 29%. This is above the level for the initiation of fungal decal.

This defect should be repaired as further deterioration of the hardwood core would only allow further deflection which would ultimately cause serious damage to the coachroof moulding and possibly the loss of the rig through inadequate rig tension. The mast and compression post should be removed and the transverse floor removed entirely. A new floor of GRP laminations over an Iroko core constructed as per the original design but with adequate sealing of the limber hole.

Recommendation

(Cat 1) Remove and re-instate a new forward most keel floor in way of the mast compression post. Repair compression post and re-instate, checking that the coachroof recovers its original camber profile.

c) Topsides

The topsides are finished in a white gelcoat with a double cove line stripe in vinyl tape. The topsides have since been painted with a spray applied two component polyurethane or polyacrylic paint . The hull topsides are bonded internally to full and partial bulkheads and longitudinal members throughout the vessel. When viewed there are only very slight signs of this internal structure visible in the topsides.

The topsides are in overall good condition. The only significant area of damage is in the stem where the paint and the underlying gel coat have been damaged by berthing and by anchor weighing. This damage is down to the laminate in places and has been temporarily repaired with an epoxy filler. The stem should be repaired properly and re-painted. If the paint is polyacrylic the edge to the old paint can be blended in and polished out. If the paint is a pure polyurethane it cannot be polished out and the edge must be masked which may leave a witness line

Recommendation

(Cat 3) Repair the impact damage to the stem and repaint.

The hardness and cure state of the topsides is tested with a Barcol Impresser. This gives a reading normally in the range of 38 to 40 Hba for a fully cured and properly consolidated GRP laminate. Many readings were taken around the topsides ranging from 38 to 44. An average of 42 Hba was recorded. This is considered satisfactory.

The gel coat was tested with a Shore D Durometer. This recorded hardnesses ranging from 89.5 to 93.0 HSD which is good, (88 to 90 is considered normal). A fully cured two component polyurethane paint film has a slightly lower Shore D hardness than gel coat but at only 50 to 70 micron thickness will have a negligible effect on the hardness readings. The good readings however do indicate that high build fairing primers have not been used. This implies that the surface was in good condition before painting and did not require fairing.

d) Hull to deck seam

The hull to deck seam is achieved by an inward moulded flange on the hull. The deck moulding is cored with balsa to a point within the deck edge equal to the width of the flange. The lack of balsa core on the deck edge creates a rebate which lands with bonding paste onto the hull flange. This results in a flush deck head. This is then flo-coated over. There was no sign of leakage through the seam or movement. The flo-coat, where viewed in the cockpit locker and by removing panels in the accommodation, was unbroken.

The joint is then covered externally with the aluminium toe rail which is through bolted before the joint is flo-coated beneath. The toe rails are in good condition and are not unduly bent or loose. There are several fittings fastened to the rail which are detailed elsewhere. The whole assembly is neat and strong and free of leaks.

e) Deck

The deck is constructed from balsa cored GRP laminates. The outer deck skin is moulded with a non-slip texture in the gelcoat which is pigmented with a light blue colour. There are margins of gloss white gelcoat around all the deck fixtures. The non-slip texture is in good condition and still effective underfoot. The deck was also tested with a moisture meter. This was tested with a Tramex Skipper Plus moisture meter which is also a capacitance tester. It is more suited to testing textured surfaces as it uses foam rubber pads.

Representative readings on a Tramex Skipper Plus are different to the Sovereign Quantum and the comparative scale for moisture content in GRP laminates approximate as follows:

0-15 Regular readings for a ‘dry’ GRP laminate
16-38 Slight absorption typical of permeability of weather exposed GRP
39-65 Medium moisture content, could be osmotic but unlikely to blister
66-100 High moisture with a possibility of physical degradation at higher ranges

These are readings for GRP. Balsa core material is kiln dried and hermetically sealed until used. Thus the balsa should have a negligible effect on the moisture readings. This is not true for plywood due to its higher density and the multitude of glue lines. It would be expected for readings in the vicinity of through deck fittings, where plywood core is incorporated, to be slightly higher than the remainder of the deck.

Readings taken over the whole deck showed a general level of 15 to 25 on the comparative scale. Around the genoa tracks and cleats the readings were up to 30 as expected. Around the chainplates for the cap and lower shrouds the readings sharply increased to 85. The chainplates are spaced apart by about 40cms and the readings actually reduced slightly in the space between.

The sharp edge to the increase suggests that there is plywood in the core around the chainplates and that the plywood has become saturated. There would be a kerf of solid resin between the balsa and the plywood and this could act as a moisture barrier preventing penetration into the balsa. The deck appears to have a small degree, 2mm approx of lift or heave local to where the starboard cap shroud chainplate passes through the deck.

It is relevant to note that the chainplate is a 10mm stainless steel flat bar that passes through the deck and is fastened to the laminated-in plywood cored web frames beneath. It is not actually fastened to the deck at all. Movement of the chainplate in the web will not cause heave in the deck. Heave in the deck could be caused by the laminated web becoming detached from the hull and pulling the deck upward. Alternatively the deck core could be swollen through absorption of water.

The laminated in web frames, where visible through a gap in the cupboard back panel, appeared well laminated to the hull and structurally sound and dry. On the limited examination possible with a snake camera of the chainplate fastenings into the web, they appeared in good secure and un-corroded condition. When tested with a moisture meter set to read %age moisture in hardwood, the accessible part of the web was between 11% and 17%. This is relatively low as moisture levels of 28% to 30% are necessary for fungal decay to be initiated in timber structures.

The possibility of failure of the chainplate webs beneath the deck cannot be discounted in this instance. It is a characteristic of this form of construction and has

been seen in similar vessels. These fittings are obscured by a large joinery shelving unit which is held by just a few screws and moulded trims. It would be recommended that this joinery piece be removed to allow for full and regular examination of the under deck chainplate structure.

Recommendation

(Cat 1) Remove the joinery shelving units each side for a full inspection of the chain plate structure.

The heave in the deck could be caused by water ingress into the plywood pads causing the plywood to swell. Timber swells 10 times more across the grain than with the grain, therefore end grain balsa core will swell only a fraction as much as plywood which is all flat grain. The chainplates are sealed by small rectangular escutcheons which are retained into the deck by screws. These should at least be removed and re-bedded to limit further water absorption and prevent the possibility that water can eventually rot the laminated in web frames

Recommendation

(Cat 1) Remove and re-bed the escutcheon plates which seal the chainplates.

In time it would be necessary to repair the saturated plywood pads. This could be done with minimal intrusion from below by drilling a series of holes through the GRP skin and the wood but not through the upper deck skin. The wood core can be dried out by injecting methylated spirit which will mix with the water and reduce the evaporation point.

Provided the wood is still structurally sound the wood can be treated with a borate solution or ethylene glycol which will kill any active fungal spores. When thoroughly dried the holes should be filled with a thickened epoxy and the under deck GRP skin is re-laminated. If the wood is badly decomposed it would need to be removed in its entirety. This would need to be done from the outside by cutting out the upper deck skin.

Recommendation

(Cat 2) Repair the saturated plywood pads in way of the chainplates.

f) Superstructure and cockpit

The coachroof superstructure and cockpit are all integral with the deck moulding. The coachroof top features the same moulded non-slip texture in the gel coat. This surface is in good condition with no chipping of the raised profile. The coachroof top was also tested for moisture with a Tramex moisture meter. This read satisfactorily

dry with readings averaging 10 on the comparative scale except for two distinct areas in way of the baby stay and the mast plinth.

The baby stay is attached just aft of the forehatch. This is a short stainless steel bar laminated in locally under the deck with the chain plate as a short flat bar welded to it. There is also an escutcheon plate over the fitting to seal in to the deck. The deck has a significant amount of heave around the fitting and the out deck skin is split.

Baby stay tension has caused damage to the coachroof and the fracture has allowed water to enter the deck core. Most of the time the baby stay carries little load, but if beating to windward with a reefed mainsail, main sheet tension through the leach will place a multiplied load directly onto the baby stay.

The structure supporting the baby stay must be removed and re-instated in a more substantial manner, ideally full width to where the coachroof moulding is laminated to the forepeak joinery. The ideal design would be an upright T bar fabricated from two welded sections of 5mm x 25mm stainless steel flat bar. The vertical part should be ring rolled to the coach roof camber before welding up. This should have the chainplate welded to it and the whole bonded to the underside of the coachroof with bonding paste. The paste should be run as a fillet around the horizontal part and then laminated over.

Recommendation

(Cat 1) Remove and re-instate a more substantial full width baby stay chain plate cross beam.

The damage to the coachroof moulding in way of the baby stay chain plate must also be repaired whilst the chain plate is removed. The wet core can be scavenged out around the aperture and the remainder dried as detailed previously for the side decks. The outer skin must be ground back to solid laminates with a 12:1 feather edge and repaired.

Recommendation

(Cat 1) Repair the damage to the coachroof laminates in way of the baby stay chainplate.

Stepped upon a moulded plinth with a hardwood core on the coachroof is the mast step. This was viewed from all angles. There was a significant deflection and negative camber in the coachroof around the plinth and stress cracking of a series of parallel lines was seen on both sides of it.

This is supported from below by a steel compression post which is encased in ropework. This compression post is stood onto a transverse member in the keel floor matrix which is also depressed. This defect is detailed elsewhere. The coachroof top

should adopt its correct positive camber once the compression post is repaired and re-instated. The stress cracking should then be repaired.

Recommendation

(Cat 3) Repair the stress cracking around the moulded mast plinth.
There are numerous other areas of stress cracking and crazing particularly around the cockpit and lockers and the anchor locker lid. This is to be expected in a vessel of this age. They are too many to individually identify but they should be repaired as they could possibly be a cause of water ingress into the laminates. They are also unsightly and could affect the perceived value of the vessel. The individual lines of crazing should be lightly grooved back to the laminate with a Dremel tool or similar and the grooves filled with a white pigmented gel coat filler.

Recommendation

(Cat 3) Repair the stress crazing around the cockpit, anchor locker lid and other areas.

There are two Lewmar hatches set into the coachroof top. These are detailed elsewhere. At the after end of the coachroof is the main companionway with a sliding hatch which slides within a hatch garage. The hatch garage is a separate moulding inset after the installation of the sliding hatch. This is all detailed elsewhere. Aft of the main companionway is the cockpit.

The cockpit is surrounded by a high coaming with winch gear set upon it, these are detailed elsewhere. The coamings have moulded recesses which house the engine instruments, the shore power socket and the bilge pump. The cockpit seating and sole is moulded in the same non-slip texture as the deck. This is rather more worn but still felt secure underfoot when wet.

The cockpit sole has a removable panel for removal and refitting of the engine. Around the panel are gutters for the cockpit drains which run to a large skin fitting on the port side waterline. There is a gas bottle locker and a single cockpit locker on the port side which is full depth to the hull. The holding tank occupies the bottom of the locker and is covered by a false floor panel.

The locker lid is hinged at the outboard edge and is secured by double latches with hasp and staple for padlocks. There is a lanyard with hook to secure the lid in an open position when hooked to the winch drum. All is in a reasonable functional and cosmetic condition for the vessels age. The locker also provides access to the fuel tank and the back of the bilge pump and engine control installations.

g) Hatches & Companionways

The companionway hatch is a one piece GRP moulding. This slides in stainless steel runners fixed to the coachroof top. The hatch sits over an upstand which diverts surface water and channels it into the cockpit. The hatch has a moulded profile at the after end is a hand hold. All operated efficiently.

The companionway is closed by two part washboards. These are substantial acrylic panels. There is a closing louvered ventilator in the upper panel. The washboards were in good condition with little crazing or scratching evident. The boards slide into moulded GRP channel in the companionway bulkhead located by a stainless steel strip. The whole is locked by a barrel lock in the upper panel which engages in the sliding hatch. All operated well and secure. All is in good working condition.

There are three opening hatches in the deck and coachroof. All are aluminium framed Lewmar Ocean hatches with acrylic glazing. On the coachroof aft of the mast is a rectangular hatch which gives light to the saloon. On the foredeck is a similar larger hatch which is hinged on the after edge.

It is usually recommended for a hatch in this location to be hinged on the forward edge as it will prevent it being carried away by a breaking wave if left unfastened. If considering using this vessel for extended offshore passages it would be recommended to remove and reverse this hatch.

In the coachroof to the aft cabin is a large square hatch which gives light to the aft cabin. Both this hatch and the fore cabin hatch are suitable as escape hatches as they are of sufficient size and have a secure foothold beneath in the berth bases. All the hatches were in good condition with no signs of leakage beneath. All have reasonably clear acrylic glazing.

h) Windows and ventilators

The main coachroof windows are all fixed portlights. These are aluminium framed with toughened glass glazing. There are six windows, equally disposed three each side. All the glazing is clear with some light scratches. There are no apparent signs of leakage but the inner frames are secured over the headlining so leakage could occur behind the headlining and not be seen. The headlining has become detached from where is was adhered to the GRP but this is normal for a vessel of this age irrespective of leaks.

There are four dorade type ventilators in the coachroofs. Two to the forward cabins and two to the aft cabin and a pair to the heads and galley compartments. These last pair are solar powered ventilators. Additional ventilation to the accommodation is provide by the hatches having a ventilation setting and the louvre in the washboards. All are in good functional condition.

i) <u>Deck gear and fittings</u>

A pair of aluminium T bar sheet tracks by Lewmar is mounted on the side decks either side. Each carries a stand up sheave block for sheeting the genoa which slide on cars. These are controlled in their movement by spring loaded pins which engage in holes in the track. All is in good working condition with no signs of grooves starting to wear in the sheaves. Grooves can prevent rotation and lead to damage to the rope. This is all well secured.

Genoa sheets run from the track via cheek blocks on the sides of the cockpit coamings to the primary winches. These winches are self-tailing two speed Lewmar 40's. Secondary winches for spinnaker sheets are old style two speed Lewmar 16's. The winches sound firm in operation and could not be back wound but could not be tested under load. It is always recommended that winches are serviced if their history is not known.

<u>Recommendation</u>

(Cat 2) Service the winches and replace the pawl springs.

The main sheet block is a four part purchase and is tacked off to a car on a main sheet track which sits on a moulded profile which spans the after end of the cockpit. This is well secured and the block is in good working condition but none of these sheeting fittings could be tested under load.

A pair of aluminium cleats are mounted on the foredeck and a pair of closed fairleads associated with them are incorporated into the ends of the toe rail at the bows. There is also a pair of alloy cleats on the aft quarters and similar associated closed fairleads in the toe rail. There are also a pair of midships mooring cleats but no fairleads for them. All these fittings are well seated and secure.

A fabricated stainless steel stem head fitting incorporates a single bow roller installed with a roller shaped for chain. This fitting also carries the forestay chainplate and a strap which bolts down through the stem. This appeared in good condition but could not be tested under load.

Chain plates are single stainless steel tangs which pass through the deck and are fastened to laminated web frames below. These frames transfer the rigging loads to the longitudinal hull stringers. The chainplates have stainless steel escutcheon plates screwed to the deck but these fastenings are not designed to be load bearing. The chain plates are secure with no sign of movement.

The back stay chainplate is bolted through the after upper face of the transom. This appeared well seated and secure. Any signs of corrosion products emanating from stainless steel fastenings should be investigated as hidden anaerobic crevice corrosion in stainless steel can lead to sudden failure due to corrosion stress fracturing. *(See explanatory note 5)*

A Simpson Lawrence Seawolf horizontal windlass is mounted to a plinth in the anchor locker. This has an integral chain gypsy with a warp drum on the side. This is a single speed, i.e. lift only winch with a single foot button mounted in the fore deck alongside the windlass. To lower the chain the there is a friction clutch on the side of the drum. The windlass appeared in good physical condition but was not tested.

j) Safety equipment

The vessel is equipped with a tubular stainless steel pulpit and pushpit. The pulpit is a one piece five legged fabrication and is a continental style with a step though section at the stem. This is to enable crew to disembark when moored bows to. It is secured by bolt fixings through the toe rail for the after legs similar to the stanchion feet and is socketed into the stemhead fitting. This is a relatively unstable shape due to the rake at the stem and there is some flex evident but there is no movement in the foot fastenings.

The pushpit is a two piece fabrication with a pair of short guard wires secured with pelican hooks between. This is to provide access to the transom step and the boarding ladder. The pushpits are inherently more stable and are fastened with similar stanchion type bolt fixings through the toe rail at the sides and bolted through deck aft. All is in good sound condition. .

There are four stanchions each side and the guard wires run from the pulpit and terminate at the pushpit. The guard wires are in 4mm 1x19 stainless steel wire with roll swaged terminations and tensioned by rope lanyards. The guard wires are adequately tensioned at the time of survey and are in good condition. The rope lanyards should be replaced whenever they require tensioning. Synthetic rope fibres will fuse together when bent around a hard point. These fibres will be weakened if subsequently straightened.

On stanchion on the starboard side aftmost is bent about the lower guardwire hole. The aluminium will have work hardened and it is likely that a fatigue fracture would develop when it was bent straight again. This would eventually fail with serious implications for crew safety. This stanchion should be replaced rather than attempt repair.

Recommendation

(Cat 1) Replace the starboard aft stanchion.

The stanchions are aluminium tubular fittings with forged heads. The feet are cast aluminium and bolted through the toe rail. The feet are secure in the rail but there is movement between the stanchions and some of the feet. All the stanchions in good condition although one appears bent as previously noted. There are good hand holds inside and outside of the vessel. There are two pairs of teak hand rails along

each side of the coachroof. There is a pair of aluminium handholds either side of the companionway both inside and outside.

Handholds are located both sides of the accommodation under the saloon windows, and a post is built into the top of the partial bulkhead beside the galley. All were well seated and secure. There are no harness strong points in the cockpit and there are no jack stays fitted along the side decks although they are mentioned in the inventory.

There is a horseshoe lifebelt installed on a bracket on the pushpit and a floating light attached to the lifebelt with a tether. There is also a danbouy in a housing alongside. The floating light worked when inverted, the rest of the equipment could not be tested in use.

k) <u>Skin fittings & seacocks</u>

Note; Bronze *is conventionally an alloy of copper and tin, but the term is now popularly used to describe a wider range of copper based alloys which have no tin content but zinc and other elements which can provide similar dezincification resistance. There is no non-destructive test for alloy composition which is practical within the scope of this survey. Where visible casting marks indicate a particular alloy, it will be described. Otherwise, where the term 'bronze' or 'brass' is used in this report it denotes a copper based alloy of indeterminate composition. (See explanatory note 7)*

There are five though hull fittings below the waterline. All but one of the valves are nickel plated brass ball valves. Two valves are for the sea toilet. The toilet discharge valve is a 1 ½" valve located in the bottom of the cockpit locker although there is a small access hatch from the heads compartment. This is in poor condition and has deposits of white crystalline hydroxide which is the result of the nickel plating oxidising due to water leakage from the hose tail. The handle could not be turned and is stuck in the partly closed condition.

The flush valve is a ¾" valve located in the after end of the port settee berth. This is in better condition and is free turning. It was tested for soundness and colour and found to be sound. The heads compartment basin drain valve is in the joinery beneath the basin. This is a 1" ball valve and also tested as sound but also is seized in the open position.

The galley sink drain valve is a 1" valve located under the galley sink. This is almost inaccessible as the fridge compressor unit has been mounted in front of it. When tested the handle was seized, it could not be tested for soundness or colour. The engine cooling water valve is a ¾" valve and was free turning and sounded well and showed good colour.

All these valves had markings indicating size and a PN number which is a pressure rating. There was also a casting mark CW617N. This is a leaded bronze where the lead is added to improve machining. It does not aid corrosion resistance and is not a marine quality brass although they do meet the RCD requirement for a 5 year service life.

These valves should be kept under observation because they are prone to dezincification where the metal is weakened by the zinc eroding out of the alloy leaving the remaining metal soft and fragile. When testing skin fittings the metal should be scraped back to bare metal and checked for colour which should be a bright brass/gold. Any sign that the colour is carrot red and the metal sounds dull when tap tested is an indication that the metal has suffered from dezincification, and the valve must be replaced. *(See explanatory note 13)*

The skin fittings themselves were all scraped back to bare metal and seen to be a good colour. These should also be checked regularly and replaced when necessary. The seized valves should be replaced. It is not practical to repair seized ball valves as they are not serviceable. When replacing valves or skin fittings always use dezincification resistant alloys which will be marked DZR or CR or with the alloy classification CW602N or CZ132.

Recommendation

(Cat 1) Replace the seized valves with DZR valves to CW602N. It is often easier to remove and replace the skin fittings and valves complete.

The one valve which is not a nickel plated valve is the 2” ball valve for the cockpit drains. This is an ISIS brass valve marked CR. This is new looking and was in good condition and free turning. The engine exhaust fitting is also below the waterline and is a bronze fitting but without a closure fitted. This was tested for soundness and colour and found to be good.

There are no tapered wood bungs attached to the skin fittings for sealing the fitting in the event of a failure. These should be individually tethered to each fitting so that they are available for immediate use.

Recommendation

(Cat 1) Install appropriately sized tapered softwood bungs tethered to each skin fitting for closing in the event of failure.

There is a bonding system linking a hull anode to the skin fittings. This is no longer common practise *(See explanatory note 8)*

Not all the hose to the skin fittings are double clipped. It is normally recommended that hoses should be double clipped but only where the hose tail is long enough to

accommodate the second clip fully. A second clip which is not fully seated can actually cause a hose to become detached.

I) Engine

The engine is a Volvo Penta 2002. This is a marinised naturally aspirated 850cc 2 cylinder four stroke diesel engine. This engine produces 18hp at 3200 rpm. There is no hours meter installed in the revolutions counter so no running hours could be recorded.

The engine is fresh water cooled with seawater drawn from the skin fitting and pumped via an engine driven Jabsco type pump through a water cooled exhaust manifold and heat exchanger and discharged into the exhaust elbow. The intake hose runs through a seawater strainer located above the intake valve. This is below the waterline so that it can only be opened and cleaned whilst the engine is stopped.

The hose to the Jabsco pump is reinforced EPDM hose. The pump is covered in salt crystals and the pump appears to be leaking which could explain the water in the bilge. The pump has a rear seal and a gap in the drive casing which prevents water leaks getting into the engine. These pumps can therefore leak form either the front cover or the rear seal. There are spares available and the pump should be fully serviced.

Recommendation

(Cat 2) Service the Jabsco water pump with new impeller, seals and cover plate.

The closed cooling system pumps fresh water with an internal circulating pump through the heat exchanger. When the engine is at full working temperature a thermostat diverts the cooling water through the block and head. Before entering the heat exchanger. There is a header tank to the system and it was filled well below its minimum level but did appear to contain a weak antifreeze mixture.

Water from the closed cooling system is diverted through a heating coil in the calorifier to produce hot water for the fresh water system. The calorifier is an insulated copper bodied unit in the after end of the engine space. This is detailed elsewhere.

The exhaust is in exhaust hose and runs to a waterlock/muffler located immediately after the engine under the aft cabin bunk. The hose then runs to a swan neck inside the cockpit locker and exits in a bronze exhaust fitting under the port transom. All was in good condition.

The engine was seen to be in a weathered but fair cosmetic condition. There was some superficial surface corrosion and flaking of paint. This was mostly around service items and the exhaust elbow. The oils were clean and free of particulates.

The oil level was well filled. The alternator belt was well tensioned and there were no signs of rubber powder deposits on the engine.

The engine is set on resilient mounts. The mount rubbers were good with no signs of powdery decomposition. The engine control levers operated satisfactorily. There is a single lever engine control on the starboard side of the steering binnacle. The engine instrument panel is mounted in a recess in the port side of the cockpit coaming.
.
The engine is mated to a Hurth MS2B gearbox. The gearbox oils were clean and well filled. The gearbox has a reduction ratio of 2.4:1. The gearbox oil is cooled by an integral oil cooler which is plumbed into the engine raw water cooling circuit immediately after the intake valve. The gearbox oils showed some emulsification. It is not known how long it is since the oils were changed but clearly the oil cooler is leaking water into the gearbox. This gearbox is no longer in production but spare parts are still available.

Recommendation

(Cat 2) Repair or replace the oil cooler to the gearbox

The engine control panel is in a good condition and includes warning lights for oil pressure, water temperature and alternator output. There is a gauge for engine revolutions. The engine was started after extensive cranking. Although the air temperature was cold it did appear that the engine took excessive time to get sufficient compression to fire. Once started the engine settled down to an even idle without undue noise or unusual vibration or emissions of smoke. The true condition of an engine can only be established by sea trail where an engine can be brought up to full operating temperature. It must also put under full load and full power.

m) Fuel system

Diesel fuel is stored in a painted steel fuel tank located in the after end of the cockpit locker. This is of approximately 150 litres capacity and is filled via a hose from a flush fitting in the adjacent side deck. The tank is in good condition and is well secured. The tank was inspected with a snake camera all round and underneath and there were no signs of leakage. Fuel level can be measured with a mechanical gauge in the top of the tank. Fuel is drawn from a siphon fitting in the top of the tank.

There is a shut off valve after the siphon fitting which turned when tested. Fuel runs in fuel hose to ISO7840 A2 to a primary fuel filter located in the after end of the engine space. This filter unit is a CAV296 type and is in good condition and includes a glass water separator bowl. There was a quantity of water contamination in the fuel. Water in the separator is an indication that there is also water in the tank as the siphon tube draws from a point above the bottom. There is a large inspection hatch in the top of the tank for cleaning.

Recommendation

(Cat 2) Remove the inspection hatch and drain and clean the tank. The fuel can be re-used after allowing water to settle out and filtering any bacterial gel.

From the filter fuel is supplied to the engine lift pump by similar hose and the return from the injectors is in ISO7840 A2 hose back to the fuel tank. There is fuel leaking from a split in the input hose to the fuel lift pump. This has clearly been leaking for some time as there are fuel soaked J cloths in the bilge under the pump. The section of hose from the filter to the pump should be replaced.

Recommendation

(Cat 2) Replace the section of fuel hose from the filter to the lift pump. This hose must be to ISO 7840 A2

Also from the tank via a separate siphon fitting is the fuel supply to the Webasto heater. The heater itself is located under the aft cabin bunk and is a Webasto Thermo Top which heats and circulates coolant in plastic piping round the vessel to fan assisted radiators. The coolant is also circulated in a heating coil in the calorifier to heat the domestic water. The installation appeared to be well executed and in good condition although it was not tested for operation. The on/off and temperature and timer control is located in the panel under the aft cabin bunk.

n) stern gear

The auxiliary propulsion is a conventional shaft drive propeller. The shaft is held in a clamp coupling and is a 1” diameter stainless steel shaft. It was non-magnetic indicating that it was a 300 series austenitic stainless steel. The shaft turned in a conventional bronze stuffing gland which was greased via a plastic pipe from a screw greaser located in the engine space. The handle was turned and came up to pressure indicating that there was grease in the system. There were no obvious signs of leakage from the stern gland although a small container had been placed beneath. This was seen to be dry.

The shaft exits the hull and is held in a cast bronze P bracket. This was secure in the hull with no signs of movement. After the bracket is the three bladed conventional propeller. This was heavily coated in calcareous deposits and no dimensions could be seen. The propeller was scraped back to bare metal and was seen to be of good colour. It was also hammer sounded and rung well. There was evidence of some small cavitation damage on the back face of the blades near the root, but not enough to give concern.

The propeller was held in a tapered keyway on the shaft and well secured with a bronze dome nut and split pin. There is a shaft anode fastened before the P bracket which is 50% eroded and should be replaced. The shaft was tested for electrical

continuity with the hull anode and was seen to be good with a resistance of less than 1 ohm. The hull anode was also well eroded and should be replaced.

Recommendation

(Cat 2) Replace the hull anode and the propeller shaft anode

The size of the propeller could not be seen. A calculation of the hull displacement and dimensions and engine specification indicates a maximum speed of 6.44 knots with a 15x9 three blade propeller. The calculations show that the vessel is slightly underpowered with this engine as displacement speed should be 7.0 knots which would require an engine rated at 24hp.

o) Steering system

The steering is by a counterbalanced spade rudder hung on a short skeg. The rudder is fabricated from two clam shell mouldings which are bonded together and foam filled. This design is vulnerable when a rudder bearing is immersed as on this vessel. This is because the seal between the stainless steel rudder stock and the GRP clam shell is almost impossible to maintain watertight due to the stresses exerted on the rudder in use.

Moisture absorption is not unusual for rudders of this construction. When tested with a moisture meter the rudder was up to 30 on the Sovereign deep scale. The highest readings were at the top indicating that the shaft is probable source of the ingress. It is not practical to try to achieve a permanent fix due to the limitations in the design but this reading is actually quite low for a rudder of this kind of construction.

The rudder stock is a 1 ½" diameter stainless steel shaft which runs in a rudder tube which is laminated into the hull bottom. The shaft then passes into the aft cabin and exits under the aft cabin bunk. When stressed there is a small degree, approx 1mm, of movement in the bearings. This is not sufficient to cause a problem when steering under way. The rudder stock is held in nylon or acetal bearings in the hull bottom and in the cockpit coaming.

There is also a third support at the bottom of the short skeg which is a cast bronze gudgeon through which the rudder stock passes. This gudgeon is bolted to the bottom of the skeg. This means that the rudder is fully supported even if the quadrant is removed from the top of the rudder stock. The rudder stock terminates is a milled square for attachment of an emergency tiller.

The top of the rudder stock is clamped in a cast aluminium quadrant which carries the steering cables. The steering is a Whitlock Constellation system in which a short length of simplex roller chain is turned on a sprocket on a shaft from the steering wheel. This is all held in the top of the steering pedestal. 7 x 19 stainless steel cables are attached to the chain and run through turning blocks to the quadrant. The system

was efficient with no discernible slack and the cables in good condition and well tensioned.

Under the quadrant the rudder tube terminates in a stuffing gland. This is clearly leaking as there is water in the compartment and there are heavy hydroxide deposits around the dogging plate. There is no limber hole to drain water into the main bilge. This gland should be tightened until it stops leaking. If this tightening is ineffective or the plate closes right down to the gland, then the gland needs to be re-packed. It should be re-packed with PTFE impregnated gland packing.

Recommendation

(Cat 2) Tighten or re-pack the rudder tube stuffing gland

p) Mast spars and rigging

The mast is a masthead rigged aluminium spar by Kemp with single in-line spreaders. The mast is silver anodised which is in good unmarked condition. It is a stout relatively thick walled section and well supported. The spreaders are attached to cast spreader roots riveted to the mast. There are compression struts through the mast to prevent the section compressing through rig tension. There was no discernible movement in the roots when the spreaders were swigged vigorously.

The mast has a groove at the after face for conventional sliders with a removable gate. The mast was in column and the rig adequately tensioned. The mast is stepped on an aluminium mast step set upon the coachroof. There is a slight deflection in the mast step due to compression loads. As detailed elsewhere. The mast is fitted with two halyard winches and one reefing winch. These are mounted on riveted angled plates. All are Lewmar single speed 7's and the ratchets sounded firm but they should be serviced as previously noted.

The boom is also by Kemp. The gooseneck is an aluminium casting riveted to the boom end. This shows little sign of wear and the pivot pin sits near vertical. This pivot attaches to the riveted mast fitting. All is well seated and secure. The pin is eye ended and carries a pair of reefing horns. It is secured with a nut and split pin. There should be nylon thrust washers either side of the gooseneck gudgeon. And a stainless steel washer under the eye end to prevent it wearing the alloy casting.

Recommendation

(Cat 2) Replace the gooseneck nylon thrust washers and stainless steel washer under the head.

The boom is a rectangular section with three sheaves for reefing lines. All turned and appeared intact with no flat spots. At the after end there are also sheaves in good working condition. The kicker is a telescopic gas strut type by Selden with a

threepart purchase for control. All was in good condition but could not be tested in service.

The rigging is conventional for a single spreader rig with in-line spreaders, having continuous cap shrouds, and aft lower diagonal shrouds fastened to separate chain plate fittings. The shroud upper terminations are roll swaged forged fittings with a cranked T head which engage in reinforced slots in the mast. These swages lie in the line of load. The stays are a single forestay, baby stay and a single standing backstay. All terminations lie in the correct orientation for the rigging loads.

All the shrouds are in 8mm 1x19 stainless steel wire with roll swaged fork ended terminals and open bodied rigging screws. The standing backstay is 7mm 1x19 stainless steel wire, there is no adjustable tensioner for the back stay. The forestay could not be seen as it is contained within the furling system. This is usually the same gauge as the backstay. All the rigging screws were seized with split pins to prevent unwinding. The shrouds were covered by plastic sleeve ‘sail savers’

All terminations were closely examined for signs of broken wires, corrosion and withdrawing of the wire from the swage. The swages were also examined for correct forming and signs of splitting. The rig is understood to have been replaced in 2012. It is generally advised that, when vessels are laid up with the rig stepped, the rig is de-tensioned to prevent the wire work hardening through harmonic vibrations. If a careful note is made of the number of turns the rig can be re-tensioned and set up without the need of a professional rigger

The forestay is enclosed within the furling gear and luff foil. This is a Selden Furlex 200S unit and was seen to be in good condition but could not be tested in service. Housed on fittings on the mast was a silver anodised aluminium spinnaker pole also by Selden. This could not be tested in service but the pistons worked effectively.

q) Sails and running rigging

There were four sails seen on board, all the sails were by Jeckells. The furling genoa is a white Dacron sail and was seen to be in serviceable condition. The cloth was still well resinated and the stitching in fair condition. The UV strip was slightly faded but in good physical condition.

The mainsail is a white Mylar laminate sail and also in useable physical condition with good stitching and clean and reasonable free of mould and staining. The spinnaker was in very good, almost unused condition. There was also another mainsail which was in a white Dacron. This was in a poorer condition and is probably the one replaced by the newer Mylar sail.

The running rigging is all of double braid polyester. All were heat sealed and whipped. The halyards had mousing loops in the whippings, these had been well executed. The ropes were all in good serviceable condition.

r) <u>Sea toilet and heads compartment</u>

The sea toilet is a Blakes Lavac. This is a vacuum operated toilet and the pump is built into the bulkhead with access through the cockpit locker for servicing. This is situated facing inboard in the heads compartment. The discharge valve is located in the locker also but can be accessed through an opening port in the heads. The flush water valve is located under the saloon berth. The valves are detailed elsewhere.

The discharge hose is in a black odour free sanitation hose and runs to a diverter valve behind the bulkhead in the cockpit locker. This valve directs the suction of the Lavac pump to discharge either the toilet or the holding tank. There is a second diverter valve above the pump which diverts the discharge either overboard or to the tank.

The holding tank is a stainless steel welded tank under the cockpit locker sole. There is a deck pump flush fitting in the adjacent side deck drawing from a siphon tube in the tank. This has a 1 ¼" nylon reinforced PVC sanitation hose. There is a vent to the tank with a ¾" similar hose. It is usually recommended that the vent is of a similar size as the high vacuum developed in shore pump out stations can cause collapse damage to some holding tanks. The tank should be observed during pump out and the vent enlarged if a problem is seen.

The tank is in good condition and there were no signs of leakage. The discharge system is complicated and a diagram for proper operation should be prominently displayed to prevent accidental discharge. All is in good functional condition although the toilet could not be tested.

<u>Recommendation</u>

(Cat 2) Affix a diagram for proper operation of the toilet holding tank system

The heads compartment has a small hand basin mounted in the top of a moulded cabinet. The faucet delivers mixed hot and cold water from the water tank and calorifier. The faucet is extendable with a flexible hose so that it can be used as a shower head. The toilet sole is equipped with a drain under a recessed section in the moulding. This recess would originally have been fitted with a teak grating. This sole drains into a sump tank located under the saloon sole. This tank has a float switch and a centrifugal pump which discharges overboard.

The basin is also fitted with a single tap which delivers cold water from a Whale TipToe foot pump located in the bottom of the moulded cabinet. The basin drains through a skin fitting and a valve located in the cabinet beneath. These valves are detailed elsewhere. The heads compartment also features two storage cupboards, a sliding door cabinet and a mirror. All was in good serviceable condition.

s) Fresh water system

Fresh water is stored in two GRP moulded tanks located under the saloon berths. These are filled by a flush deck filler located in adjacent starboard side deck and another in the port cockpit coaming. The tanks are of approx 180 litres combined capacity. The tanks are enclosed by joinery so could not be examined except at the ends where the filler, drain and vent fittings are located. These appear in good condition. There is apparently no senders installed so there is no record of water level.

Only the tank on the port side is connected to the pressure pump but the two tanks are connected by a balancing pipe so the pump can draw from either tank. This also means that if either tank is empty then the pump will only draw fresh air. The outlet from the starboard tank is not connected and is closed off by a valve. This outlet should be connected to a T fitting in the pipe between the port tank and the pressure pump.

Recommendation

(Cat 2) Install a supply pipe from the starboard water tank to the pressure pump supply.

Fresh cold water is delivered by a Jabsco par-max pressure pump located under the port saloon berth. There is an accumulator tank after the pump which smooths out the water flow. Cold water is then run to the mixer faucets at the galley and heads basin. Cold water is also supplied to the calorifier in the engine space. The calorifier is a thermally insulated copper bodied tank and is estimated at 20 litres capacity. This then supplies hot water to the same two mixer faucets. All the water from the accumulator runs in in blue nylon reinforced PVC water hose. The pump worked when tested and delivered water but the hot water system could not be tested.

t) Galley

The galley is in an L shape with twin round stainless steel sinks in the forward facing part of the worktop. All the worktop is covered in a blue laminate and there are generous teak fiddle fronts to all the work surfaces. Fresh cold water is supplied to the sinks by a foot pumped faucet and pressurised hot and cold water to a mixer faucet. The sinks drains through a skin fitting in the cupboard beneath. All is in good working condition

Below the sink is a hinged door cupboard. There are also large sliding door cabinets at two levels in the joinery behind the worktop with holders for crockery. There is a small cupboard under the cooker. And a small top loading bin in the corner of the L. The cooker is facing outboard and is gimballed with pan clamps. This is detailed elsewhere. There is also a slide away cover to the cooker. All is in good apparent working condition

There is a crash bar in front of the cooker but no loops for a bum strap. All is in good condition with no damage or water staining to the joinery. In the after end of the worktop is a large top loading fridge unit. The Isotherm compressor unit is mounted in the bottom of the cupboard under the sink. The fridge chilled down efficiently when tested.

u) Electrical system

There are two batteries located in the after engine space. Both are 110 amp/hr deep cycle leisure batteries. One is for the domestic circuits and one is the engine start battery. The batteries were tested for voltage and the engine battery recorded 12.76 volts which is 20% drained and the domestic battery recorded 12.98 volts which is fully charged. The circuits were tested for drain and the recorded negligible currents indicated that the circuits were well insulated.

Charging of the batteries is from the 50 amp engine driven alternator and controlled by a diode splitter in the engine compartment. Charging is also available from a Sterling 20 amp switch mode battery charger mounted in the cockpit locker. There are battery condition and current drain moving coil meters by the chart table and a selector switch to indicate which battery is being recorded. The gauge appeared to display engine battery voltage proportional to those measured, but the scale is not closely graduated.

The batteries are well located in a battery box but are not strapped down which would prevent them becoming dislodged in a knockdown. Isolator switches for the batteries are located in the joinery alongside. There is no means of bridging the battery banks for emergency starting. Supply to the domestic circuits is distributed from the electrical systems switch panel at the chart table. This panel has the two moving coil meters previously noted.

The switch panel carries 24 switches. All are circuit breakers. All the switches were tested and the circuits powered up although it was evident that there were faults in the wiring to the LED indicators as some lit when the other switches were operated.

Recommendation

(Cat 2) Inspect the wiring at the back of the panel for short circuits affecting the LED displays

All the appliances powered up and were tested for function where possible. In the saloon there are down lights in the coachroof head and reading lights to each berth in the bulkheads and to the chart table. To the forepeak there are only reading lights. The aft cabin has a down lights and reading lights. All are individually switched and worked when tested. There are two switched 12 volt power sockets at the chart table. These could not be tested.

The pulpit mounted navigation light and stern light on the pushpit were tested and seen to be working, as was the steaming light and the deck light. The masthead lights could not be seen in daylight. The supply to the navigation instruments worked when tested. The instruments are detailed elsewhere. The switch panel also carries the circuit breaker for the windlass and the control for the bilge pump. Both are detailed elsewhere

The 240 volt shore power supply cable is seen on board and the deck socket is housed in a recess in the port cockpit coaming. The shore power system was not connected at the time of survey. The consumer unit is located in the cockpit locker. This contains an RCD device and three circuit breakers. There is no galvanic isolator or isolating transformer seen. There is also no reverse polarity detector. *(See explanatory note 14)*

The consumer unit is a HI-TEC switch mode battery charger also. The installation of a newer Sterling unit alongside suggests that this HI-TEC unit is only being used now as a consumer unit for the shore power. The three breakers are for the battery charger, the immersion heating element in the calorifier and the power sockets. There are power sockets to the galley, chart table and all three cabins although none could be tested. The electrical wiring throughout the vessel is neat and well secured. The majority is encased in flexible conduit.

v) <u>Gas system</u>

The gas locker is located in a dedicated locker in the port side cockpit seating. This locker drains overboard through a skin fitting in the topsides. Held within is a single 4.5 kg butane gas cylinder. The hose is old and undated. The regulator is also undated. The gas is supplied through the vessel in drawn copper pipe fixed at intervals by clips and a shut off valve is installed under the cooker, this turned when tested.

From the valve a braided flexible hose delivers gas to the cooker. No date could be seen on this hose either. Both the hoses are marked BS3212/2 which is the current standard. It is recommended that gas hose is replaced after 5 years and regulators after 10 years.

<u>Recommendation</u>

(Cat 1) Replace the gas hoses and the regulator

The gas cooker is an Plastimo Neptune 2000. This is a two burner cooker with an oven and grill. There are flame failure devices on all the burners. The cooker was in good clean and functional condition but it was not tested. It is well gimballed and fitted with pan clamps. There are no other gas appliances on board.

w) Fire fighting equipment

There are four fire extinguishers seen on board. One installed in the galley is a powder type 1kg 8A 55B C unit with no manufacture date. It has a gauge which reads good pressure. One installed by the chart table is a powder type 1kg 5A 34B C unit with no manufacture date but a gauge with good pressure. In the aft cabin is an identical unit in the same state.

There is a service record on all the extinguishers showing next service due in July 2001. The fourth extinguisher is a 2kg FE36 Halon Replacement gas unit in the engine space. This is ideal, powder type extinguishers should not be used on engines when they are running. *(See explanatory note 11)*

Recommendation

(Cat 1) Service or replace the powder fire extinguishers. At least one extinguisher should be placed within the forward accommodation and one which is accessible from outside the accommodation.

There is a fire blanket mounted on the bulkhead beside the chart table. There is a bunged extinguisher hole in the engine box which allows an extinguisher to be discharged without opening the engine covers.

x) Bilge pumping

There is one manual bilge pump installed on this vessel. This is mounted in the port cockpit coaming and is a Whale gusher type. The pump handle is located on a clip in the cockpit locker. This draws from the keel sump and there is a strum box fitted on the hose end. The pump discharges through the port topsides.

An electric bilge pump is a Whale 6300 litres per hour centrifugal pump. This is located in the keel sump under the saloon table and discharges through a skin fitting in the port topsides. This is operated by a whale automatic float switch located beside. It is switched at a panel by the chart table and worked when switched to manual.

y) Interior fit-out

The fit out is executed in teak effect laminate faced plywoods. This is an early built vessel and the later models used real wood veneers. The laminate has probably lasted better than the later boats fit out. In general it is in good condition although there are places where it is becoming de-laminated from the ply substrate. This is particularly on the shelving units behind the settee berth.

The joinery is well executed with all panel work edged with PVC edge banding. All the joinery mouldings, fiddles and trims are in solid wood which is finished in a satin varnish to match the satin laminate. Also the thin plywood hull linings and shelf dividers are in satin finished teak faced plywoods. Some of these are becoming detached and in one place a nail is poking through.

Recommendation

(Cat 3) When removing the shelving units for inspecting the chain plate fastenings, repair the delaminating laminate and the loose ply panels.

The engine space is sound insulated with foil faced multi layer foam. The edges have all been finished and sealed with foil tape. This has been well excuted and is in good condition.

The sole boards are all in varnished teak and holly striped veneered plywood. There are finger holes to the lift out panels for access to the bilges. They are in generally good condition for their age. The fixed panels are screwed down to the transverse floors but most of the screws are missing or have no grip in the holes. In some places new screw fittings have been put in next to the originals. The panels are a good fit and do not actually need to be fastened down.

The upholstery is in a blue woven fabric with a breathable backing. The foam on the settee backs is sculpted to shape. All is in virtually unmarked condition and is probably of a more recent addition. The coachroof head is finished in vinyl covered plywood panels. These are fitted between mahogany hardwood battens. These panels give access to the deck fittings.

The hull linings are in a foam backed vinyl and is fairly unmarked and still well attached. Where this vinyl is fitted around the coachroof sides and retained by the window frames, it has become unglued from the GRP but is still retained. This could be due to leakage from the windows. There are no curtains to the saloon windows or blinds to the hatches.

There is extensive storage available under the forepeak and aft cabin bunks. Also substantial cove lockers and shelves above all the bunks. The settee berths to the saloon are fitted with lee cloths.

z) Additional equipment

The following equipment was seen on board the vessel.

Plastimo Olympic steering compass on binnacle, good condition, no bubble
Raymarine ST60 Tridata display, powered up, no signal
Raymarine ST4002 autopilot display, powered up, tested and working
Raymarine wheel pilot drive unit, powered up, tested and working
TackTick wind speed and direction display, powered up, tested and working
Windex wind indicator and VHF antenna at masthead
Garmin GPSmap551s, chartplotter fishfinder, powered up, tested and working
Simrad RD68 DSC VHF, powered up, tested and working
Standard Horizon HX851 handheld VHF, not tested
Pioneer FM/CD player, not tested
Pair speakers to saloon, not tested
Brass cased clock, not working
Brass cased barometer, calibration not checked
Blue polyester canvas sprayhood, fair condition
Blue polyester canvas stak pak sail cover and lazy jacks
Cockpit table and leg, stowed under companionway
Fender stowage brackets on pushpit Stainless steel
boarding ladder
Petrol generator, tested and working
Carbon monoxide alarm, untested
First aid kit
Firdell Blipper radar reflector
Various warps and fenders
Folding ball and cone
Outboard bracket on transom
Waveline 260 inflatable dinghy
Delta anchor and chain on stemhead, functional condition
CQR anchor and chain in locker, functional condition

4) Summary of recommendations This is intended as a check list. Full details must be read and can be found in the body of the report. Page references are indicated (P ?

Category 1 recommendations are safety or seaworthy related defects which should be corrected before the vessel is put into commission.

(P 8) Remove and re-instate a new forward most keel floor in way of the
(P 11) Remove and re-bed the escutcheon plates which seal the chainplates
(P 11) Remove shelving units each side for a full inspection of chainplates
(P 12) Re-instate a more substantial baby stay chain plate cross beam.
(P 12) Repair the damage to the coachroof under the baby stay chainplate.
(P 16) Replace the starboard aft stanchion.
(P 18) Replace the seized valves with DZR valves to CW602N.
(P 18) Install appropriately sized softwood bungs tethered to each skin fitting
(P 28) Replace the gas hoses and the regulator
(P 29) Service or replace the powder fire extinguishers

Category 2 recommendations relate to defects which affect the operation of the vessel in normal use and should be attended to at the earliest opportunity.

(P 11) Repair the saturated deck in way of the chainplates
(P 15) Service the winches and replace the pawl springs
(P 19) Service the Jabsco water pump with new impeller, seals and cover
(P 20) Repair or replace the oil cooler to the gearbox
(P 21) Remove the inspection hatch and drain and clean the fuel tank
(P 21) Replace the section of fuel hose from the filter to the lift pump
(P 22) Replace the hull anode and the propeller shaft anode
(P 23) Tighten or re-pack the rudder tube stuffing gland
(P 23) Replace the gooseneck nylon thrust washers and head washer
(P 25) Affix a diagram for proper operation of the toilet holding tank system
(P 26) Install supply pipe from starboard water tank to the pump supply
(P 27) Inspect the wiring at the back of the panel for short circuits

Category 3 recommendations relate to conditions which are cosmetic or may affect the perceived value of the vessel and could be attended to at the owners discretion.

(P 9) Repair the impact damage to the stem and repaint.
(P 13) Repair the stress cracking around the moulded mast plinth
(P 13) Repair the stress crazing around the cockpit, anchor locker lid etc
(P 30) Repair the delaminating laminate and the loose ply panels

5) Conclusions

The Moody 34 is an example of early British volume boat building. British boat builders unfortunately didn't have access to the mass Mediterranean charter market. They were also reluctant to relinquish some acceptable minimum standards of scantlings and construction methods as specified for Lloyds classification. As a result many British volume boat builders found that they could not compete with the continental builders and eventually either ceased trading or were bought out. Moody Yachts are now owned and built by Hanse Yachts of Germany and are seen as one of their premium brands.

This reluctance to reduce standards has meant that the yachts produced at that time will endure. Provided with regular maintenance and upgrading of equipment, they will always hold their value. [redacted] is a good example having had the benefit of recent investment in electrical installations, the rig, sails, heating and holding tank. Her overall condition is sound and the defects noted are few when compared with the majority of 30 year old volume built boats.

The recommendations list is long and contains a few structural issues that do need addressing but they are not too intrusive or expensive relative to the value of the vessel. The list also contains upgrading of time expired equipment and routine maintenance issues. There is some opportunity for further investment in navigation electronics and possibly a replacement engine, but that is discretionary expenditure as the existing equipment is perfectly functional.

The hull is sound and free of structural or moisture related defects. The rig is in good condition with recently replaced standing rigging. The sails are fully functional although their shape and set could not be seen. The engineering is original but of a good manufacture and there is evidence of regular maintenance. Once the priority items on the recommendations list are attended to the vessel will make a safe and seaworthy vessel with potentially many more decades of service.

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