MEDUSA
MARINE

S1538- Pre-purchase full condition survey report on:

Moody 36 CC - [redacted]

For:

[redacted]

Surveyed at [redacted]

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Nominated Coding Surveyor for small commercial vessels

Member Royal Institution of Naval Architects

Accredited Member Yacht Designers & Surveyors Association

Tonnage Measurer for all Red Ensign Flag States

Full Condition Survey Report on Yacht [redacted]

This survey was carried out 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 afloat and later held in slings ashore at [redacted]

c) Purpose and scope of survey

This survey was carried out under Medusa Marine standard terms and conditions. These are available on our website:

http://medusamarine.co.uk/index.php/terms-and-conditions/

The survey was commissioned by the purchaser for the purpose of establishing the condition of the vessel prior to completion. 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 snake 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. Surfaces coated with layers of paint cannot be examined for damage evident on the substrate beneath the paint coat. Sails where present, were examined for general condition. The sails were not set, so no assessment of fit, shape or stretch could be made. Spars and rigging, where stepped, could only be examined visually from deck and ashore.

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 defects of those aspects of the vessel not accessible, or reasonably evident, due to the above limitations.

e) Recommendations

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

Category 1 (Cat 1) recommendations 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.

2) The Vessel specifications and description

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

LOA:	10.97 metres
LWL:	9.30 metres
Beam:	3.76metres
Draft	1.52 metres
Displacement: (light)	6.668 tonnes
Ballast:	2.454 tonnes
Builders:	Marine Projects (Plymouth) for AH Moody & Sons
Model or Type:	Moody 36 CC
Year	1981
Designer:	Angus Primrose
Registration (part one):	[redacted]
Yard No:	[redacted]
MMSI No:	[redacted]
Lloyds HCC No:	[redacted]
Construction:	GRP Hull and deck
Engine / Gearbox:	Thornycroft 90 (BMC 1500) / TMP 12000
Foresail area(100%):	24.43 sq metres
Mainsail area:	22.58 sq metres
Rig:	Masthead Bermudian sloop

This vessel was built before the 16th June1998 and therefore is not subject to the requirements of the Recreational Craft Regulations (SI 1996/1353). It was built before before the 2005 (Directive 2003/44/EC) which includes environmental emission limits. Vessels that were built before 1st January 1985 and within the EU prior to 1992 are considered VAT paid. This boat was built in the EU before 1985 so proof of VAT paid status would not be required.

This vessel is displaying a UK Flag Part 1 registration. The registration is assumed to be the original and does constitute proof of ownership back to the first owner. It is transferrable on sale provided the bill of sale is recorded with the registry. It requires renewal every five years and is assumed to be still valid.

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 as a bespoke yacht builders and they gained a fine 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 the renowned yacht designer and racer Angus Primrose. A total of eight designs were produced for Moody by Primrose before he was lost at sea in in the1980 Observer single handed transatlantic race (OSTAR)

The centre cockpit Moody 36 CC was his fourth design launched in 1977. A total of 89 vessels were built by the time production ended in 1981. All vessels were fin keeled and wheel steered Bermudian sloops. The model was re-designed by Bill Dixon as an aft cockpit model, the 36C using the same hull and rig. A further 19 were built before this was replaced by the all new Bill Dixon designed Moody 37 in 1985.

[redacted] is a 1981 centre cockpit Moody 36, Hull number [redacted] out of the combined production of 108, so is one of the last built. The design is of a relatively modest displacement hull with undistorted underwater lines. To the topsides, the raked stem, distinctive sheerline and excessive flare are all characteristics of the Primrose designed Moody yachts. The round bilged hull form gives way to a broad, slightly retrouseé transom. The beam is carried well aft with tumblehome and combined with the high freeboard, creates a high volume hull.

The keel is a semi-hydrodynamic iron fin bolted into a moulded socket in the hull bottom. The broad waterline beam and firm bilges will give good initial form stability, however the modest 35% ballast ratio means the yacht would benefit from being reefed early in a blow. The Moody 36 is a yacht which is designed for cruising comfort rather than performance. The masthead rig has single in-line spreaders.

The rig is simple with cap and aft lower shrouds pinned to separate chainplates, a single forestay, a standing back stay, and a baby stay. The mast is stepped on the coachroof with a compression post incorporated into the saloon table. Sail area is roughly evenly distributed between the head and main sails which allows for easier sail handling and lighter loads. Although there is also a large 140% overlapping genoa.

This vessel is fitted with an aftermarket in-mast reefing system for the mainsail. This is a channel section riveted to the aft mast face with the sail luff held in a rotating spar. Reefing lines are led back and winched at the cockpit. There is also furling gear for the genoa with the control line led back to the cockpit. The cockpit has a walk round steering pedestal and a locker to starboard which is full depth to the hull.

The accommodation provides for up to six berths, with a double V berth sleeping cabin in the forepeak separate from the accommodation.by a heads and shower compartment to starboard with a hand basin and hanging wet locker opposite. In the saloon a settee berth and an L shaped dinette are set either side of a fixed drop leaf table with fiddles.

Aft in the saloon is a large galley to starboard. To port is a chart table which forms part of a passageway leading through to the aft cabin. The cabin has an athwartships double berth and an en-suite heads compartment. The engine is mounted beneath the cockpit and drive via a propeller shaft held in a P bracket.

3) Survey details

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 manufacturers data, the hull construction is of solid hand laid-up polyester resins and gel coats. The hull construction is considered to be moderately light at just over six and a half tonnes for her length and relatively broad beam.

The hull is moulded in a split female mould. This is to allow the de-mouldingof the tumblehome and swage line to the topsides and the inward deck flange. The hull is stiffened by foam cored stringers and frames, and an almost full length internal tray moulding forming sole board and berth bases. The hull is strengthened by full and partial bulkheads bonded and laminated to the hull. The internal hull bottom has moulded transverse floors which stiffen the hull in way of the keel socket. These are bonded and laminated to the hull bottom.

The forwardmost transverse floor carries the main bulkhead which ties into the longitudinal stiffening member. This floor and bulkhead also provides a support for the deck stepped mast step mounted on the coachroof top. Overall the hull construction is considered to be of good design and of competent construction.

b) <u>Bottom and Keel</u>

The bottom is finished with a blue antifouling painted coating. This is a poorly adhered coating and flakes off easily showing it to be up to four coats of blue and another seven coats of red antifouling beneath. These are applied over two layers of what appears to be an old type of barrier coating. This could be an epoxy or even an early polyurethane. The barrier coating has failed in many places exposing white gel coat and also bare laminate in places.

The whole hull bottom is covered in a rash of blisters. These vary in size from about 6mm to 25mm in diameter and all have well defined edges. When burst open some had fluid within but others were dry. When tested with a litmus paper the fluid measured at a PH of 3.5 to 4. This is acidic as a PH of 7.0 is neutral and seawater is slightly alkaline at PH of 8.1.

The smaller blisters were seen to have mostly formed between the cream and white layers of the barrier coat and occasionally between the red antifoul and the white coat. The larger blisters had formed between the white gelcoat and the first layers of laminate. These are all the result of osmotic absorption where the permeable paint and gelcoats will attempt to balance the PH between the alkaline seawater and acidic elements within the lay-up, drawing water in under pressure and forming blisters. *(see explanatory note 1)*

The hull bottom was measured for moisture which is also an indication of osmotic absorption. All readings were initially taken through the antifoul. This is beneficial to prevent damage to barrier coatings. Moisture readings were taken with a Tramex Skipper Generation 5 Marine Moisture Meter. This 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.

Some antifouling coatings with high metallic components and water retention can affect moisture readings. The antifoulings extended above the waterline, so readings were taken on the topsides and through the coating above the waterline. The two adjacent readings were substantially different with the topsides around 30 and the antifouling around 40. The difference can be deducted from the under waterline readings to be considered representative.

The two scales can also be used to eliminate spurious readings generated by condensation or metallic components inside the bilges. the shallow scale reads up to 10mm into the surface and is generally the most reliable with vessels of this size. The deep scale can read up to 30mm and will pick up plywood cored compartment dividers and floors as well as bilge water.

The comparative scale is 0 to 100, which is an arbitrary scale, and does not represent actual percentages of moisture in GRP. Figures are thus quoted as scale readings and not as percentages. Representative readings approximate as follows:

0-15 Regular readings for a ‘dry’ GRP laminate
16-38 Slight absorbsion typical of permeability of weather exposed GRP
39-55 Medium moisture content, could be osmotic but unlikely to blister
56-70 High moisture, osmotic process but not necessarily physical defects
71-85 Very high, usually physical defects, blistering and wicking evident
86-100 Extreme saturation moisture with a visible structural defects

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

Weather:	Overcast after early heavy rain
Wind:	South West 6 to 8 kts
Air temperature:	17°c
Hull surface temperature:	16.5°c (port) 16.0 °c (stbd)
Relative Humidity:	90%
Dew point:	15.3°c
Hull temp above dew point:	1.2˚c to 0.7˚c

It is normal best practise to want a difference of at least 5°C between hull temperature and dew point in order to ensure the evaporation of all surface moisture.

Moisture readings were taken on both scales although the shallow scale reads up to 10mm into the surface and is generally the most reliable with vessels of this size. The vessel had been lifted only 2 hours previously and drying conditions had not been good. Shallow scale was up to 100 and deep scale ranged from 55 to 70. Several areas were scraped back to the red antifoul layer and shallow scale reduced in these spots to 85 to 90 and deep scale was 50 to 65.

This showed the presence of absorbed moisture in the hull laminates which has been causing the blistering. Blisters in the paint coats and gel coat zones are not considered to be a structural defect as the laminates are not affected. The hull bottom was also hammer tested for delamination and voids. It was also viewed for shape and no distortions or undulations were seen. There is some laminate damage in the larger blisters to the rudder and skeg as is detailed later. The hull bottom does need to be treated.

A full osmosis treatment would involve stripping and planing off the the paint and original gelcoats from the hull laminates, washing and drying down to a minimum moisture level and the application of a fresh epoxy gel coating. This would be an expensive process at about £6,000 to £8,000 and not necessarily recommended for osmotic absorption at this level and in a vessel of this age. The alternative is to remove the loose and flaking paint coats, Grinding out and epoxy filling the larger blisters in the gelcoat and fairing back the smaller ones.

This would not reduce the moisture in the hull so further blistering may occur. The evidence of past blisters will remain and the presence of the defect could affect the perceived value of the vessel when offered for sale as it will always be evident to an experienced surveyor when lifted and surveyed.

Recommendation

(Cat 2) Treat the blistered hull bottom by whatever method is most suitable

A good routine of laying up on hard standing for several months every lay-up season should prevent the hull laminates suffering more extensive degradation. This preventative routine is good practise for any hull of this age and made of the older resin types. There is no automatic guarantee however that structural defect to the build laminates on this hull could never occur in the future. (*See explanatory note 1)*

The keel is a trapezoidal shaped iron casting that is slightly flared toward the foot. There is also a widened top flange where it sockets into the hull bottom. The keel is secured by bolts in pairs that are fastened through the hull bottom into this flange. The bolts were seen to be flow coated over internally and tested showed magnetic flux indicating that they were of mild steel. Mild steel is stronger than stainless steel and preferred for this application.

The keel is in a poor cosmetic condition with an almost evenly distributed occurrence of blistering from pustules of surface corrosion beneath the paint. This is no more than a cosmetic defect and will only serve to slightly reduce performance. This does not represent any loss of ballast material and could be treated by grit blasting back to bare metal and epoxy coated, but in a casting of this age the corrosion will probably return.

The landing seam was gapping in places where sealant that had been applied was poorly adhered and had fallen away. This has caused some of the flaking antifouling coats to also fall away. The vessel was lifted and lowered so that the weight of the hull was placed on the keel. There was no deflection over most of its length froward but the very after end was seen to compress into the socket and trapped water was squeezed out. There is also a slight flexure in the moulding and the antifouling has flaked off back to the gelcoat.

This movement was only seen in the unsupported section of the keel landing seam bonding aft of the rearmost fastener. There was no sign of failure of the keel floor structure internally although the aftmost part is below the fuel tank cavity and cannot be viewed. This movement and squeeze should be observed each time the vessel is lifted to ensure it does not extend further. The seam should be raked out to remove any old or poorly attached sealant. The seam should be dried, primed and re-applied with a high modulus polysulphide sealant.

Recommendation

(Cat 2) Rake out landing seam slot, clean, dry, prime and re-apply sealant

c) Topsides

The topsides are constructed of solid GRP laminates with a white gel coat finish. There is a thin gold stripe below the sheer line in a vinyl tape. This is inset in a moulded cavita line with a moulded Moody graphic device at the bows. The vinyl has aged and crazed in places. There is also a broad blue gelcoat to the sheerline which has faded and worn exposing white gelcoat beneath. It is a thin coat that has been applied into the mould and covered by the white hull gelcoat. Model graphics in vinyl tape at the quarters is peeling and flaking on the starboard side.

The topsides are in a fair condition for the vessels age except for a deep gouge on the port side amidships which is through to the laminates. This should be repaired. The surface otherwise has a good gloss level and is relatively un-weathered for its age. There is also some light abrasion damage at the stem and the transom edges, and some old repairs that have been poorly executed and of a slightly different shade.

Recommendation

(Cat 2) Repair the deep gouge to the port side topsides

The hull laminates were tested with a Barcol Impresser. This tests the hardness of the laminate and so can establish the consolidation of the lay-up and the level of cure of the resins. Readings of 35 to 39 were seen which are slightly low average as 38 to 40 is considered to be normal for marine grade isophthalic and orthophthalic resins The Impresser was calibrated before and after testing with check samples and found to be accurate.

The hardness and cure state of the gel coats themselves were tested with a Shore Durometer. This will also show any progressive softening due to oxidisation. Readings ranging from 89.5.0 to 91.0 HSD were made over all the surface which are good as 88 to 90. Both these hardnesses would be affected by temperature and would be lower on a warm summers day, but these are acceptable figures and show the hull laminates to be well consolidated.

d) Hull to deck seam

The hull to deck joint is achieved by the hull having an inward facing flange. The deck edge is flat and is landed onto the hull flange with bonding paste. An aluminium toe rail fits over the external joint to the deck edge and also along the transom and the whole is through bolted. The joint is occasionally visible in the storage compartments and chain locker. Where viewed the bonded joint is sound with a good squeeze of bonding paste emerging from the joint internally. There is no evidence of failure or apparent leakage.

The aluminium toe rail has an upstand with elongated holes perforated through. These are slightly distorted and abraded in places where the holes have been used to secure turning blocks and fittings. The stanchions bases are also fastened through this upstand. At the bows and aft quarters there are fairleads incorporated into the rail. All these fittings are in a variable condition as detailed elsewhere, but the toe rails are intact and firmly seated.

e) Deck

The deck is constructed from solid GRP laminates, there is no core material in the laminates except in way of chainplates and deck fittings. The deck moulding is finished in the original white gelcoat which has been painted over with a grey non-slip textured deck paint in the tread areas. The deck was hammer tested both above deck, and also below deck where accessible. It was also walk tested for delamination, spring and heave. All was found to be good and firm.

There is slight spring in the foredeck well which was assumed to be a result of the large unsupported area. The deck head at this point was partially visible in the chain locker. The deck was also tested with a moisture meter. Moisture readings were taken with the Tramex Skipper 5 Marine Moisture meter. The readings can be interpreted slightly differently when measuring composite cored construction as follows:

0-15 Regular readings for a dry balsa cored GRP composite
16-20 Slight absorption typical of weather exposure to the laminate
20-40 Medium moisture content, could be some ingress into the core
40-70 High moisture, water ingress into core with possible structural defects
71-100 Saturation of core and possible decomposition of core material

Moisture readings over the whole of the deck ranged from 25 to 40 but with noticeable elevation to 90 or 100 around all the chain plates. It was also up to 100 around the windlass, along the forward end of the starboard genoa sheet track, and also to the afterdeck by the backstay chainplate. This was reading on the deep scale and could all be explained by plywood backing pads being laminated into the lay-up where compressive bolt fasteners are used for attachment.

The meter is reading moisture absorbed into the plywood, shallow scale readings were all much lower showing no damage to the laminate itself. The chainplates are not actually fastened to the deck but are straps bolted through web frames laminated between the hull and the deck. The deck was walk tested and appeared firm and sound underfoot and no significant sign of heave when measured with a straight edge. Stressing the shrouds by hand did not appear to cause movement in the chainplates or surrounding deck. The chainplates are detailed later.

f) Superstructure and cockpit

The coachroof superstructure and cockpit are all integral with the deck moulding. The coachroof top features the same grey paint in the tread areas with white gel coat to the coachroof sides and margins around moulded profiles. This surface is also in a fair condition. The coachroof top was also tested for moisture with the Tramex 5 moisture meter. This read satisfactorily dry with readings averaging 20 to 45 on the comparative scale.

Particular attention was paid to the baby stay chainplate and also around the mast step. These have been seen on other vessels of this model to have suffered from moisture ingress into the core pad material, but none was seen on this vessel. The mast step was also viewed from all angles and there was no significant downward deflection in the coachroof around the plinth. The mast step is supported from below by a substantial compression post stood onto a transverse floor moulded into the hull bottom and no failure or deflection could be seen in the support structure..

There are moulded plinths for hatches, dorade ventilators and also a breakwater to protect the cockpit and as a mount for the sprayhood. This also incorporates a hatch garage for the companionway sliding hatch. This is a separate moulding fastened after the hatch is installed and is quite flexible so standing on it should be avoided. This is all in good order and the fittings are detailed later.

The cockpit is covered by a full canvas cover with a sprayhood covering the companionway, and an aft section completely covering the cockpit, both are erected by stainless steel tubular hoop frames. The canvas is very weathered and stained by algae but basically sound. There are vinyl window panels to all parts that are fogged and have very poor clarity, particularly to the sprayhood. The canvas could be cleaned and recovered but the sprayhood window panels should be replaced. Until that is done the sprayhood should always be folded down when underway as it severely reduces forward visibility.

Recommendation

(Cat 2) Replace vinyl windows to sprayhood

The cockpit is surrounded by a high coaming with winch gear set upon plinths outboard. There is a single locker in the cockpit on the starboard side that is full depth to the hull side. The locker aperture has gutters moulded around the apertures which enable water to run off into the cockpit. There is deep star crazing to both forward corners where the locker lid has slammed onto the gutter edges or where crew have jumped down onto the locker lid.

It is a poor design detail where the gutter rim acts as the shut. The star crazing could be repaired but would probably return after time. The lid opens up against the seat backs and is unstable and there are no stays or lanyards to hold it open. This makes it very difficult for a single person to access the locker contents. The lid is secured by twin anti-rattle latches and padlocks.

The cockpit sole is made of a large moulded GRP panel that closes over a moulded gutter which drains aft. There is a pair of cockpit drains that run via hoses to discharge surface water through ports just above the starboard waterline. The lifting panel gives full access to the engine space beneath and the stern gear. The steering pedestal may need to be removed to enable the engine to be removed.

Forward on the starboard side is a shallow locker dedicated to the storage of the gas cylinders, this is detailed later. The cockpit sole and seating was also tested for moisture ingress and all was at a moderate level. When viewed from beneath the cockpit sole is a single skin moulding stiffened by overlaminated box section ribs.

g) Hatches and companionways

The companionway hatch is a GRP moulding. The hatch has a rounded top to match the camber of the coachroof top. The hatch sits over raised profiles in the coachroof top. The raised profiles divert any surface water back into the cockpit and the hatch slides within nylon runners on the sides of the coachroof. All is in a fairly good and sound condition.

The companionway is closed by a two-part washboard. These are teak faced plywood panels that are in a sound physical condition. The washboards engage in moulded channels and retained by stainless steel strips. The companionway is secured when closed by a cylinder lock and lever in the upper panel that engages with the sliding hatch. All is efficient and secure when locked.

There are three opening hatches in the coachroofs. One to the forepeak is a Lewmar Ocean hatch which is an aluminium frame glazed with acrylic which is bonded in. The hatch is hinged on the forward edge which is the ideal orientation for hatches in this location as it prevents flooding the forepeak or it being carried away by a boarding wave if left unfastened.

This hatch gives light to the forepeak cabin. It is 500 mm square and is suitable as an escape hatch and can be opened from both sides as is normally recommended. It has a secure foothold beneath in the berth base. The hatch is in good condition but the glazing is crazed by UV degradation. This affects visibility but should not significantly weaken it but standing on it should be avoided.

In the headlinings beneath is a hardwood frame which is damaged by water ingress and has peeling varnish and waterstaining. This is the result of water leakage but there is no evidence the hatch is current leaking. The upholstery beneath is not waterstained and this hatch is a replacement. The original hatch would have been a Canpa hatch similar to the ones mounted above the galley and the aft cabin and may have been the cause of water damage to the frame beneath.

The Canpa hatch to the galley opens sideways and is a moulded frame of glass filled nylon with a tinted acrylic panel bonded in. This hatch is original and the nylon moulding is weathered but the acrylic has been replaced and is showing good clarity. This has been bonded in with a white adhesive sealant and sealed around the edge with a fillet of grey silicone. This is not showing signs of leakage beneath.

To the after coachroof top is another larger original Canpa hatch which is also suitable as an escape hatch. This is in a similar condition with weathering to the nylon frame, but the glazing does not appear to have been replaced. This is heavily crazed by UV degradation and standing on it should be avoided. The hardwood frame to the headlinings beneath is in a better undamaged condition. Both the hatches to the sleeping cabins have roller blinds that work but are not in good condition.

h) Windows and ventilators

The windows are mounted in the coach roof sides. There are two large rectangular fixed deadlights each side to the forward coachroof and one each side to the aft coachroof. These are acrylic panes which are held in aluminium frames surface mounted over apertures cut in the coachroof sides. The frames are sealed to the GRP and through fastened by interscrews. The fasteners are hidden internally by aluminium trims.

These are all in very poor condition, particularly the forward ones to the forward coachroof where they are bisected by the heads and hanging locker bulkheads. Leakage between the glazing and the frame has allowed algae to build up inside the window. The bulkheads are also water damaged which has caused the locker hanging rail to become detached. The glazing to all the windows is crazed by UV degradation.

These windows should be removed and the frames separated so that the glazing can be detached and replaced. These should then be re-fitted with new sealant. Replacing the damaged bulkheads is not practical. They should be thoroughly dried, treated with an antifungal borate solution and hardened with a saturating epoxy.

Recommendation

(Cat 2) Remove windows and replace glazing. Dry, treat and repair bulkheads

The original fixing method needs to be replicated effectively. Purpose made glazing sealing adhesive such as Sikaflex 295 should be used with 209 surface primer. The screws should have thin nylon washers between the acrylic and the GRP to prevent the sealant being squeezed out. There must be a ‘working’ thickness of bonding between the acrylic and the GRP.

Ventilation is provided by three steerable cowl type dorade type ventilators in the coachroof top. There is one to the forepeak and one each to the heads compartment and the hanging locker and hand basin space. The cowl is missing to the forepeak cabin ventilator and it was seen stowed in the cockpit locker. It could not be seen why this was removed as it only clips over the flange. This should be re-fitted but the dorade will still work even when it is removed.

There is also a Tannoy type dorade vent to the aft coachroof top and a louvered panel in the upper washboard. This is good provision for a vessel of this size but none could be tested for efficiency. It is always recommended that the hatch above the galley is always open when the cooker or the water heater is in use.

i) Deck gear and fittings

The headsail is sheeted to a pair of Lewmar stand up blocks on cars running on T bar tracks fitted to the side decks. The blocks and cars are recent replacements and show no signs of grooves starting to wear in the sheaves. An older pair of original sheaves and cars are also fitted to the tracks. The older pair have probably been retained for sheeting the staysail or storm sail which would be hoisted on the inner forestay.

The genoa sheets are led to cheek blocks on the coaming sides and then to a pair of 2 speed Lewmar 44 winches mounted on top of the coamings. These winches have been fitted with Barton ‘Wincher’ self-tailing rubber grips to the drums. These grips are in fair condition and well secured. When they age and slip they will no longer be effective. There are also two single speed Lewmar 8 halyard winches mounted on riveted alloy plates on the mast and a Lewmar 2 speed self tailing 16 winch mounted on the coachroof in the cockpit

All the winches has positive sounding ratchets but it is always recommended to service winches annually replacing pawls and springs as found necessary. Winches can cause injury if they fail when under load. There is a bank of three Spinlock XT clutches on the coachroof handling the mainsail furling lines. These are in fair condition but the outhaul line clutch has wear stating in the jaws. This may soon start to slip and the jaws will need replacing, spares are available.

Recommendation

(Cat 2) Replace the worn jaws to the mainsail outhaul clutch

The main sheet block is tacked off to a car on a T bar track running along the aft coachroof top. This carries a 4 part purchase with a cam cleat on the lower block. This all appears to be in a good and serviceable condition but cannot be operated when the cockpit cover is erected. None of these sheeting fittings could be tested in service and under load.

A pair of alloy cleats are mounted at the bows and another pair on the aft quarters. There are fairleads for the warps mounted in the toe rail fore and aft. There is also a pair of smaller cleats mounted on the toe rail amidships. All these fittings are well seated and secure.

A fabricated stainless steel stem head fitting incorporates a single bow roller with the roller shaped for warp. This fitting is offset to starboard and also carries the forestay chainplate on the port cheek which is on the centerline. An integral strap bolts down through the stem. This appeared in good condition but the stemhead roller could not be tested in service. The fasteners are all visible in the chain locker accessed in the forepeak.

Aft of the stemhead is a Simpson Lawrence anchorman electric windlass. The windlass is bolted through the forward well deck where there is a plywood pad laminated in as a stiffener. The windlass did not work when tested with the foot switches alongside and no breaker switch or isolator could be seen. The motor and gearbox are in poor condition and badly oxidised when viewed and the drum has been cracked in the past and welded up. These defects would not necessarily prevent it operating and the switching system should be investigated.

Recommendation

(Cat 2) Investigate the switching and supply to the windlass and test for operation

The standing backstay chainplate is a triangular plate fastened through the hull to deck joint at the transom. This is secure with no sign of movement although the internal fasteners are hidden behind locker linings. Cap and lower shroud chain plates are stainless steel straps which pass through the deck and are through bolted to web frames laminated between the deck and the hull mouldings.

The port side cap shroud chainplate can viewed internally where a panel has been cut out of the cupboard lining. This has presumably been done for examination. There are plywood pads laminated into the deck as a core where the shroud chainplates are all passed through the deck. These have been saturated with water ingress which has caused the high moisture readings to the deck.

The chainplates are not fastened to the deck so the saturation of the plywood is not an issue unless the plywood core to the web frames is also affected. This is possibly why the lining has been cut out although it would have been more effective to have cut access in the side rather than the top.

This has been done with other Moody vessels where this type of construction has been used. The webframe which is accessible is sound and in good order and it would be recommended to do the same so the other chainplates can be monitored for condition. Failure of web frames of this design have been seen in other Moody models.

Recommendation

(Cat 2) Make access panels in cupboard liners to enable access to the chainplate web frames.

Leakage into the plywood pads is usually prevented by small escutcheon plates fitted around the chainplate straps and secured by fasteners into the deck. These have clearly been leaking and have allowed water to enter. It is important to prevent water entering the end grain of the plywood web frame cores. These plates must be lifted, the voids around the chainplate straps cleaned out and re-sealed to prevent further ingress.

Recommendation

(Cat 2) Remove and re-bed the escutcheon plates around shroud chainplates.

j) Safety equipment

The vessel is equipped with a tubular stainless steel pulpit and twin pushpits. The pulpit is a one piece four leg fabrication and is secured into the toe rail by alloy castings bolted through the uprights. This is a relatively unstable shape due to the rake at the stem and there is some flex evident in the fastenings.

The twin pushpits are one piece three legged fabrications mounted by the same alloy cast feet to the toe rail in a similar manner. To the side decks there are upper and lower guard wires running from the pulpit and terminate at the pushpit. The pushpits are an inherently more stable shape and there is a gap between to access the boarding ladder on the transom. This ladder is soundly mounted and provides a bottom rung below the waterline for crew to re-board the vessel from the water unaided.

The guard wires are all 5mm 1 x 19 stainless steel wire with roll swaged fork ended fittings tensioned by closed bodied rigging screws. They are in good condition and are adequately tensioned. There is further scope for adjustment in the rigging screws. There are five stanchions each side which are fastened into the toe rail by similar cast aluminium feet.

Three stanchions are tubular aluminium with cold forged heads and two are tubular stainless steel. These form gates in the guard wires for boarding from a pontoon and the tubular stainless steel is in an inverted U to provide a brace to keep tension in the standing guard wires when the gates are opened. This works well and the gates are closed by upper and lower wires secured by pelican hooks.

There is a pair of teak hand rails each side of the coachroof from the cockpit to alongside the mast step and another pair to the lower coachroof top forward. There are also teak hand rails to the after coachroof top. Substantial stainless steel handholds are also provided to the companionway sides.

There are two harness strongpoints installed in the cockpit and one is located close to the companionway to enable crew to clip on before exiting the accommodation. There are no webbing jackstays installed along the side decks for security of the crew when going forward. There are webbing jackstays stowed in the cockpit locker and these ought to be installed before taking the vessel offshore or on overnight passages.

Recommendation

(Cat 1) Reinstate the side deck jackstays that are stowed in the cockpit locker

A pair of horseshoe lifebelts are stowed on mounting brackets on the pushpits. There are floating lights attached to both lifebelts but the port side light is broken and the starboard side did not work. The lifebelts should be marked with the vessels name and a second identifier such as an MMSI number or the port of registry. A working light should be attached to one of the lifebelts and a 20 metre floating line should be fitted to the other.

Recommendation

(Cat 1) Fit floating light and line to lifebelts and mark with vessels name and second identifier

An EMS Offshore liferaft in a canister is stowed on the aft coachroof top. This is not marked for design standard and has no manufactureor next service date noted. Modern rafts have a three year service cycle until they are ten years old after which it becomes annual. It is often not economic to maintain liferafts once they are over ten years old. This raft is probably too old to be usable as the manufacturer is no longer in business.

k) Skin fittings and seacocks

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 eight though hull fittings below the waterline. Two fittings are transducers for the depth and speed log transducer which are mounted beneath the forward heads compartment sole. There is a blanking plug for sealing the log paddlewheel fitting when the transducer is removed for cleaning. These fittings appears to be in good condition and free of leakage as the compartment is dry.

The forward heads flush water intake valve is a ¾" ISIS DZR brass ball valve beneath the starboard side forepeak berth. The waste discharge valve is a 1 ½" ISIS DZR brass ball valve under the starboard saloon berth. These valves are is good apparent order with clean valve bodies and both were hammer tested as sound. The flush water valve turned but the discharge valve was seized. This should be freed up.

Recommendation

(Cat 1) Free up the seized forward heads compartment waste discharge valve

There are two valves in the engine space. To the port side is a ½" nickel plated brass ball valve for the engine cooling seawater intake. This has a brass seawater strainer mounted in the top. This is in good clean condition and hammer sounded well. The valve lever was free turning. In the after part is a ½" nickel plated brass ball valve for the aft heads toilet flush water intake. This was in poor condition, heavily oxidised and the valve seized.

In a cupboard in the aft heads compartment is a 1 ½" nickel plated brass ball valve for the toilet waste discharge. This was also heavily coated in hydroxide deposits and the valve lever seized. Both the aft heads compartment valves should be replaced.

Recommendation

(Cat 1) Replace both the aft heads compartment flush water and waste discharge valves.

In the bottom of the cockpit locker is the propeller fitting for the Sumlog speed log. This is a moulded plastic fitting with a mechanical cable drive to the log display in the cockpit side. The propeller fitting is badly damaged and the system is no longer functional having been replaced by an electronic log. This fitting must be removed and the hole in the hull made good. These fittings become fragile as they age and can lead to failure and unseen water ingress.

Recommendation

(Cat 1) Remove the redundant Sumlog propeller fitting and make good hull

There are five skin fittings just above the waterline. These are cockpit drains, shower, basin and sink discharges. These are gate valves but being above the waterline are less critical. The nickel plated valves are widely sold and used in the marine market because they pass the RCD requirement for a five year service life, but they are not marine quality.

These types of 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. This can also be identified by being coated in a white or green crystalline deposit of zinc or copper hydroxide over the surface *(See explanatory note 13)*

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. Marine quality DZR valves and true naval bronze valves are never nickel plated.

Not all the hose to the underwater 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. There are no tapered wood bungs attached to the skin fittings for sealing the fitting in the event of a failure. A bung of an appropriate size should be individually located to each fitting so that they are available for immediate use.

Recommendation

(Cat 1) Install a second hose clip and an appropriately sized tapered softwood bungs tethered to each skin fitting for closing in the event of failure.

I) Engine

The engine is a Thornycroft 90 which is a marinised version of a BMC B series naturally aspirated 1489cc diesel engine. This engine produces 36hp at 3,500 rpm. A gauge beneath the companionway shows 1,262 engine although the gauge is broken and may no longer be working. Another gauge in the cockpit shows 2,361 hours. This may be a replacement and the hours maybe should be added together to be accurate.

The engine is fresh water cooled with seawater drawn from a valve and strainer and pumped via an engine driven Jabsco type pump through a water cooled exhaust manifold and intercooler and injected into the exhaust elbow via a swan neck. A gearbox oil cooler is also included in the seawater cooling circuit. The exhaust has a waterlock/silencer installed under the bottom of the cockpit locker after a short length of hose and the exhaust hose exits near the waterline under the starboard transom. All the exhaust was in good condition.

The engine was seen to be in a fair cosmetic condition with some light surface corrosion and flaking of paint to the cylinder head and injector pump. The block was covered with oil on the port side aft. This is by the air cleaner intake and could be oil blowing out of the crank case breather that vents into the air cleaner. This can be the result of overfilling the crankcase oil which may be possible as the oil level was near the maximum despite the obvious loss of oil.

The leakage could also be from the aft tappet chest cover. This is a rectangular plate on the side of the block that gives access to the cam gear. These covers are pressed steel sealed with rubber gaskets, or cork on earlier engines. These can perish and crank case compression forces oil out past the seals. Excessive crank case compression is usually the sign of worn piston rings and bores. The oil must be cleaned up so the source can be identified.

Recommendation

(Cat 2) Clean block of oil leakage and check for source, repair as necessary

The alternator and water pump belts were adequately tensioned and in good condition. There are black powder deposits on the front of the engine but this could be historic from an earlier belt. The engine is mounted on flexible mounts to solid moulded engine beds. These were in good order with no black powder deposits from degrading rubber.

The engine control levers operated cleanly. There is a single lever engine Morse control on the after cockpit side. The engine instrument panel is mounted in the starboard cockpit side and has gauges for alternator output, oil pressure and water temperature. There is also a revolutions counter. The control panel is in a good cosmetic condition.

The engine was started eventually after application of heat. It ran on only three cylinders and stalled. After several attempts the engine eventually ran smoothly. There was a small emission of grey smoke which soon cleared. The oil pressure showed 60 psi although cold. The warning lights all extinguished and the alternator showed an output. The revolutions counter did not work and should be investigated This usually runs off the alternators alternating current before it is rectified to DC so could be a simple wiring fault.

Recommendation

(Cat 2) Investigate the non-function of the revolutions counter.

The engine is mated to a TMP 12000 drop shaft reduction and reversing gearbox. The plate couldn't be read so the reduction ratio is not known but is usually 2:1. These gearboxes have integral oil coolers with ports at the after end above the reduction gear. These ports are both leaking and show heavy crystallised deposits of white hydroxide suggesting galvanic corrosion.

This should be investigated as galvanic corrosion can rot the aluminium gearbox casing. The cooling pipework is integrated into the engine raw water cooling system and it is important the no brass or copper fittings are used in the circuit for the gearbox cooler. There are no anodes in the circuit. The hydroxides should be cleaned off and the gearbox casing and pipework examined for condition and the pipe fittings replaced and sealed as necessary. Pipework should be of steel with ¾ BSP threads into the gearbox casing.

Recommendation

(Cat 2) Clean up and investigate gearbox cooling pipework for leakage and galvanic corrosion.

It is also recommended that the raw water cooling system should be drained and fill with antifreeze during lay-up to prevent frost damage. This can result in leakage of cooling water into the gearbox leading to emulsification. Emulsification was not seen when the gearbox oils were checked but the level was very low on the dipstick. This should be replaced with 1.8 litres of 10/40 or 20/50 engine oil. There is also a spin on oil filter which needs regular replacement. Servicing gearbox oils is often overlooked.

Recommendation

(Cat 2) Replace the gearbox oils and filter

m) Fuel system

Diesel fuel is stored in a 50 gallon (227 litre) fuel tank beneath the companionway and filled by a flush fitting deck filler in the cockpit bridge deck. The tank cannot be accessed without removing installed joinery so it cannot be assessed for condition, but there is no evident leakage seen the bilge beneath. Moody tanks of this era were usually painted steel and many have been replaced.

There is no level sender or fuel gauge but the volume could be measured by a dipstick into the filler neck. Fuel is drawn by drawn copper pipe from a drain tube in the bottom of the tank in the engine space to a CAV 296 type fuel filter beside the port side engine bed. There is a shut off valve in the supply at the filter input. Fuel is then supplied in flexible fuel hose to the engine and the return is back to the tank. All flexible hose is in ISO 7840 A1 marine grade fire resistant fuel hose.

It should always be possible for the fuel supply to the engine to be shut off from outside the engine space in the event of an engine room fire. This valve should be capable of being shut off from outside the engine space. The valve could be replaced by a lever valve with a simple pull cable fitted to the lever end and led through the bulkhead.

Recommendation

(Cat 1) Fit a pull cable to the fuel valve lever to enable it to be shut off from outside the engine space in an emergency

The fuel supply to the Eberspacher heater could not be seen. It should be taken from a separate fuel fitting in the tank. If fuel for a heater is taken from the engine fuel supply line it can cause air to be drawn in and an airlock in the injector pump will stall the engine. If stalling and air locks are experienced than the fuel supply to the heater should be investigated.

n) Stern gear

The gearbox output flange holds a stainless steel propeller shaft in a coupling. The shaft is non magnetic indicating that it is a good quality austenitic stainless steel. This exits the hull in a stern tube carrying a conventional bronze packing gland on a flexible EPDM rubber hose. There was no evidence of leakage from the gland although a small pot was located beneath it, but the pot was dry.

There is evidence in the bilge of past levels of bilge water from the gland. If it leaks the gland needs to be tightened. If it still leaks then it needs to be re-packed. The gland is lubricated with grease supplied under pressure from a screw type greaser in the engine space. This came up tight when turned suggesting the gland was well packed.

The shaft exits the hull and is held in a bronze P bracket laminated into the hull bottom. The bracket is firm in the hull when stressed and a small area was scraped back to bright metal. The shaft carries a three blade conventional propeller on a taper secured by a nut and split pin. The propeller was also scraped back to bare metal and was seen to be in good colour with only light pink spots of dezincification and no cavitation damage.

Mounted behind the propeller is a Spurs type rope cutter. This has two rotating cutting blades to the shaft and should have a single fixed blade to the P bracket but this was missing. The cutter cannot work without it and ought to be removed or the static blade replaced complete with new bearings. There is also a disc type cutter on the shaft forward of the P bracket which would be completely ineffective where it is. This could be installed in place of the Spurs cutter.

Recommendation

(Cat 2) Replace the Spurs fixed blade and bearing or remove and replace with disc cutter.

A pear shaped anode is installed on the hull bottom which is about 30% eroded. This was measured for continuity and a good resistance of 0.4 ohms was recorded between the anode and the P bracket, but a very poor 34 ohm resistance seen between the propeller and the anode. This anode should be replaced and the bondings checked to ensure a good resistance of less than 0.5 ohms seen between the anode and the propeller.

Recommendation

(Cat 2) Replace the hull anode and check the bondings to ensure a resistance of less than 0.5 ohms with the propeller.

o) Steering system

The steering is by a skeg hung spade rudder. The rudder is fabricated from two clam shell mouldings which are bonded together over a stainless steel rudder stock and foam filled. The rudder blade was viewed for shape and sounded with a small pin hammer for delamination and voids and sounded well although it also has a blistered surface similar to the hull.

The rudder was also tested for moisture absorption. Deep scale readings were up to 100 with shallow scale readings of 65 to 70. The skeg was similar but showed the largest blisters with some into the layers of laminate. Some blisters were broken open and the same layers of antifoulings and barrier coats were seen. These figures would not be unusual even if the hull had shown no moisture ingress.

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 differing materials and the stresses exerted on the rudder in use. Also most natural and osmotic absorption will pass through a laminate and evaporate inside the vessel unnoticed. With closed clam shell moulding such as rudders and skegs there is no opportunity for evaporation so it remains inside.

The rudder stock is a 32mm diameter stainless steel shaft which runs in a rudder bearing which is laminated into the hull bottom. The shaft then passes through into the steering flat beneath the aft cabin bunk. The rudder stock appears to turn freely in its bearings which are probably of Tufnol, There is also a bottom rudder pintle which is a bronze casting bolted to the bottom of the skeg. When stressed the rudder is snug in its bearings.

Within the aft cabin space there is evidence of past leakage of water through the rudder gland with a residue of a mixture of white hydroxide deposits and evaporated salt crystals. The gland looks as if the packing plate is almost fully closed up and could have been recently tightened although it would have been expected that the gland would have been cleaned up at the same time. This should be checked out with the gland tightened and checked for possible leakage when underway and the rudder stock under pressure.

Recommendation

(Cat 2) Clean and tighten the rudder stock gland and monitor for leakage.

The top of the rudder stock is machined into a square profile and there is an emergency tiller located in the cockpit locker which fits over the headstock. The emergency tiller could not be tested for efficiency. The steering system is a Whitlock Titan which is a cable system with a short length of roller chain run around a sprocket on the end of the steering shaft. There are lengths of Bowden cables that lead from the bottom of the steering pedestal through the engine space to the steering flat.

These cables run via sheaves to turn a quadrant clamped and bolted to the rudder stock. All appeared to run smoothly with moderate tension in the cables. Too tight cables will increase friction and lose rudder feedback at the helm. Too loose and the roller chain can jump a tooth on the sprocket.

The steering pedestal is in good cosmetic condition. The ‘destroyer’ type wheel is covered by ornate ropework with a turks head showing the king spoke. Installed on the steering pedestal is a wheelpilot with an Autohelm electric motor driving an enclosed ring gear engaged by a lever. The control head is an Autohelm 4000 which is plugged into a socket in the cockpit. This was installed and tested with a series of dodge inputs and appeared to work appropriately to the commands. The system could not be proven in service.

p) Mast spars and rigging

The mast is a masthead rigged aluminium spar by Proctor. The mast is deck stepped and has single in line spreaders. The mast is silver anodised which is in a fairly good condition for its age. It is a relatively thick walled section and well supported. The mast was viewed and seen to be stood in column, and the rig was adequately tensioned.

The spreaders are attached to fabricated stainless steel spreader roots riveted to the mast. There was no discernable movement of the roots in the mast when the spreaders were stressed. There was a slight but trivial degree of movement of the tubular spreaders within their sockets. The mast is stepped on an aluminium mast step set upon a moulded profile ithe coachroof. There is no apparent deflection in the mast step or in the keel floor under the compression post due to compression loads.

The boom is also by Proctor. The gooseneck is an aluminium casting riveted to the boom end with cross drilled block as a universal joint. It used to be fitted to a rotating casting in the mast turned by a folding handle on the front face as the boom was originally designed for roller furling. This gear has been removed and replaced by a stainless steel plate. The block joint remains and sits at a dropped angle as the holes for the pivots are badly worn. This will still function but will need to be replaced before it fails.

Recommendation

(Cat 2) Monitor gooseneck joint and replace before it is in danger of failing.

The boom is a round section to facilitate roller furling. This is no longer used and the boom has been converted to in-mast reefing with a track and roller bearing car for pulling out the mainsail clew. The reefing system is an EasyReef with a channel section engaged in the luff groove and riveted to the aft face of the mast. This incorporates a rotating luff spar internally that furls the sail when driven by a spiral drum. This is operated by outhauls reefing lines led back to clutches and a self-tailing drum in the cockpit. This worked well when used to unfurl and furl a section of the mainsail for examination.

The rigging is conventional for a single spreader masthead rig having continuous cap shrouds and aft lower diagonal shrouds fastened to separate chain plate fittings. There is a single standing forestay, a baby stay and a single standing backstay. There is also a temporary inner forestay which is pinned to a large U bolt in the foredeck forward of the anchor well.

This forestay would need to use a removeable strop to make up the length, but this was not seen on board. The stay is tensioned by a large rigging screw which is seized. It appears that the system has not been used for a very long time. The staysail appears to be part of the original sail wardrobe but is almost unused and the piston hanks are all seized.

The shroud upper terminations are forged cranked T headed fittings which rotate and engage in reinforced holes in the mast wall. The swages were all seen to lay fair to the line of load. The lower terminations are rotary swaged fork ended terminals and open bodied rigging screws. All the shrouds are in 8mm 1x19 stainless steel wire and the baby stay is 7mm 1 x 19. The forestay could not be seen as it is contained within the furling system. This is usually the same gauge as the backstay. All of the rigging screws are adequately seized with sprit pins to prevent rotation.

All the cap shroud wires are covered by PVC sailsavers which make examination difficult as it traps debris in the wire. 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. What could be seen was examined for condition and mostly judged to be sound but showing signs of age.

the upper sections when viewed with a zoom camera appeared to show ‘candy striping’ which is a sign of stains from internal corrosion leaking through the strands. The age of the standing rigging is not known and ageing due to work hardening and cyclic stress fatigue cannot be measured by non-destructive testing.

It is generally advised that, when vessels are laid up with the rig stepped, the rig is de-tensioned slightly 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. It is understood that the standing rigging is due to be replaced and this would be a recommendation if it had not already been planned.

The genoa furler gear is a Sailspar system unit with a rope in a captive drum and an endless control line led down double blocks on the starboard side to turning blocks and a cleat. The drum and swivel part is all machined from billet stainless steel and was seen to be in good condition. It was used to unroll and re-roll a part of the genoa for inspection and worked well. There is a proper halyard diverter fitted to the mast to prevent halyard wrap.

q) Sails and running rigging

There were six sails seen on board. Two were bent onto spars and four were bagged and stowed below decksa. The mainsail is a white Dacron cross cut sail. There is no makers patch visible in the part that could be seen. A fresh breeze from the beam limited the amount of sail that could be unfurled but most wear will be in the leach and clew.

The fabric of the body of the sail was in a fairly clean and firm fabric but the leach was stained and the UV patch to the clew was faded and stained with creases to the foot where it had been badly furled. The sail is cut without battens and has no roach. The leach has probably stretched and will be prone to flutter unless the leach line is tensioned which will probably cause it to curl.

The furling genoa also has no visible makers patch. It is also a white Dacron cross cut sail with a blue sacrificial UV strip which is badly faded although intact. The sail fabric is faded and has been stained by water trapped in the rolls. Both the standing sails should be unbent and valeted to remove stains. They have both suffered from being left bent on and furled in all weathers.

Recommendation

(Cat 2) Remove and valet both the furling genoa and the furling mainsail

There are two more white crosscut Dacron sails rolled and stowed in bags in the forepeak. These are both intended for hoisting on the temporary inner forestay and have rope luffs and piston hanks. There is a storm jib made by Lucas Sails that is virtually unused. It is in good original colour but the piston hanks are corroded and seized, and there are some rust spots on the fabric from damp storage.

The other sail is a smaller No2 genoa. This sail has been used but is still in a fair and usable condition. The piston hanks are also seized and there are some rust stains to the fabric. Both these sails need to be made fully serviceable with the piston hanks freed up and carefully lubricated to avoid damaging the sail. The inner forestay also needs to be fully commissioned with a strop and the rigging screw freed up and serviced. There is no point in having an emergency system such as storm sails that are not ready for immediate use.

Recommendation

(Cat 2) Service the inner forestay and both the hanked on headsails ready for use when needed.

The running rigging is all of a double braid polyester. All were heat sealed and some had whipped ends. The halyards has soft eye ready for mousing lines and all the end treatments had been well executed. All the running rigging was very clean and clearly a very recent replacement.

r) Sea toilets and heads compartments

There are two sea toilets, both are Jabsco with black 'Twist 'N Lock' handles. The handle type and colour are important in identifying the correct spares. These are both relatively recent replacements and situated in narrow heads compartments facing out board with hoses running in swan necks in the joinery behind. Both draw seawater for flushing and discharge waste overboard through skin fittings in the hull bottom as already detailed.

The compartments are both lined out with marble effect high pressure laminate faced plywoods. The aft heads has a small handbasin in a joinery plinth with a cupboard beneath that give access to the discharge valve. All is in a good and clean condition. The forward heads has a basin and vanity unit in the hull side opposite. There are doors to the forepeak and also to the saloon that can be both closed off so that the compartment can be made full width of the vessel.

The basin has a faucet with a spray head that pulls out and can be hung up as a shower. There is a tray in the sole that is pumped out by an Electrolux impeller pump inside the basin plinth and the basin waste and the shower waste join up to be discharged through the topsides just above the waterline. The pump is assumed to be operated by the pull switch and was tested but did not run. This may be a misunderstanding of the switching as there is no other switch labelled for use.

Recommendation

(Cat 2) Investigate the switching and supply to the shower pump out

The compartment has a mirror fronted cabinet that gives access to a wet locker under the deck head. This has been damaged by water ingress through the window frame above and the hanging rail has collapsed. This should be repaired after the windows have been made good.

Recommendation

(Cat 2) Repair the collapsed hanging rail in the wet locker.

s) Fresh water system

Fresh water is stored in a moulded tank located under the port side saloon berth and the tank is filled by a flush deck filler in the adjacent side deck. The tank is of about 60 gallons (273 litres) and there is a sender in the top which reads out at a display in the galley. The tank appeared to be in good order with no evidence of leakage around the sealed down lid. The moulding is part of the internal tray moulding and there is a screwed and sealed down GRP lids with an inspection hatch.

The supply is fed to a ShurFlo diaphragm pressure pump located under the galley cupboard with an accumulator tank which smooths out the water flow and prevents pump cycling. Pressurised cold water is then supplied to the mixer faucets at the galley and the two heads basins. Cold water is then also supplied to a Paloma gas fired water heater in the galley. This is an on demand flow heater which then delivers pressurised hot water to the same faucets. This water heater is detailed later

t) Galley

The galley is in an L shape with a work top is in an off white laminate faced plywood finish that is also used for the facias beneath, there are no fiddle rails. All is in relatively good unmarked condition for the vessels age and may be a refurbishment. There are teak faced plywood cupboards and cove lockers outboard under the deckhead and also into the aft bulkhead providing good storage.

There is a deep stainless steel sink in the aft facing part of the worktop and the sink drains through a skin fitting in the topsides behind the cooker. In the outboard facing part is a gimballed cooker with two burners an oven and a grill. This is detailed later. Alongside the companionway is the water heater and both the cooker and the water heater are in apertures with aluminium heat shielding all round. This is well installed and effective.

Below the worktop is a front loading Engel fridge. This is dual voltage with AC and DC supply. The fridge was powered up and chilled down effectively when tested. All the galley and fittings are in fairly good condition with only light and occasional water staining to the joinery.

u) Electrical system

There are four batteries on board. Two are located in a box in the after engine space and two more are in a box under the aft cabin bunk. All are Varta 110 amp/hr automotive type batteries. It could not be seen how the banks are connected but it is assumed that one is for engine starting and three are supposed to be in parallel for domestic services, but voltages suggest that the two in the aft cabin are not connected for charging. All the batteries were tested for condition with an electronic drop tester.

All the batteries are rated at 680 Cold Cranking Amps (EN) which means that each should deliver 680 amps for 30 seconds whilst maintaining a stable usable voltage. This capacity will gradually diminish as the batteries age due to Lead Sulphation. This is where the sulphur in the acid will gradually solidify on the plates increasing the batteries internal resistance and reducing its ability to accept and deliver a charge. Sulphation is accelerated whenever the batteries are left partially discharged below 11 volts for long periods.

The batteries were separated for testing and the two in the engine space delivered 630 amps and 620 amps showing them to be in fairly good condition. The two in the aft cabin however showed just 70 and 75 amps. These showed voltages of only 9.48 and 10.66 so were partially discharged. They appear not to be linked to the engine battery banks and not connected to the charging system. This should be investigated and the batteries charged before they become too badly damaged. All the batteries appear to be of the same age and of recent installation.

Charging of the batteries is from the 50 amp engine driven alternator and managed by an Adverc battery management system. They are also charged by a Sterling 25 amp mains powered battery charger beneath the chart table. The 240 volt AC shore power supply is connected at a socket in the foredeck anchor well. This supplies a consumer unit inside the forepeak cove locker alongside containing a residual current circuit breaker (RCD) and two MCB's. These supply the 240 volt power sockets around the vessel and the battery charger. All appeared to be in good order but not connected.

There is no galvanic isolator installed in the shore power supply. This protects the vessels underwater metal fitting from marina ground faults and galvanic voltages up to 2 volts whilst maintaining earth leakage protection. There is also no reverse polarity detector which would be useful if sailing to the continent where polarity is often reversed *(See explanatory notes 17 & 19)*

The batteries are engaged by a four position isolator switches on the engine space bulkhead. These have one position for each for each battery positive and common switch to bridge the two banks for emergency engine starting. There is a second four position switch which may be redundant, and also a key switched single isolator which had no key. The battery switching system should be investigated and understood so that the aft cabin batteries can be brought into circuit.

Recommendation

(Cat 2) Investigate the battery switching system and label for purpose.

In theory one battery is for engine start and the other batteries are for the domestic services. In practice, neither battery bank is dedicated to either circuit. It is for the crew to ensure that the switch is used to maintain the engine battery fully charged and isolated. Care should be taken not to turn the switch through the off position as it can damage the alternator diodes.

There are two switch panels, one at the chart table and one on the engine bulkhead with a total of 13 switches. All the switches were tested and the circuits powered up. All the appliances were powered up and were tested for function where possible. In the saloon there are dome lights and LED downlights in the coachroof head, swivel reading lights to each berth, a chart reading light to the chart table and fluorescent lights to the heads compartment. All are individually switched at the fitting and all worked except the forward heads light and the chart light.

Recommendation

(Cat 2) Check the supply and bulbs to the chart reading light and the fwd heads compartment light.

All the navigation lights were tested. The stern light and pulpit combination side lights were seen working. The all-round white light to the mast truck was working but the tri-colour above was partially detached and non-functional. Also the steaming light did not work. There was a deck floodlight that worked. These two navigation lights should be repaired.

Recommendation

(Cat 1) Repair the tri-colour light and check the supply and or the bulb to the steaming light.

The VHF powered up and showed a GPS position and an MMSI number. A successful automated DSC test call was made to a handheld VHF. The GPS navigator powered up and obtained a fix. The radar powered up and a readable radar image was seen. The FM/CD player also powered up and a station was tuned in. The cockpit sailing instruments all powered up and displayed appropriately. Both depth sounders displayed.

v) Gas system

The gas locker is located in the forward starboard side cockpit under the seat. The compartment drains through the starboard topside. Held within is a 4.5kg butane gas cylinder connected to a regulator with a similar spare cylinder alongside. The hose to the locker is dated 01/2012. The regulator is undated but assumed of at least the same age.

The gas is supplied through the vessel in drawn copper pipe fixed at intervals by clips to the galley. A bulkhead fitting installed in the space behind the cooker has a shut off valve and supplies the cooker via a flexible braided hose dated 05/2011. A separate drawn copper pipe supplies the water heater with a shut off valve in the supply beneath. It is recommended that gas hose is replaced after 5 years and regulators after 10 years. Both gas hoses and the regulator should be replaced.

Recommendation

(Cat 1) Replace both flexible gas hoses and the regulator

The gas cooker is a Flavel Wayfarer two burner cooker with an oven and grill. There are flame failure device on all the burner. The cooker was in a fairly clean and functional condition but it was not tested as it is outside the scope of survey. It is well gimballed and fitted with pan clamps.

The water heater is a Paloma LPG on demand geyser type. This is not a room sealed unit so it draws combustion air from the accommodation and vents the flue also into the accommodation. This is classed as an 'attended appliance' similar to a gas cooker where usage is only made periodically and only on demand. Due to the risk of de-oxygenation of the accommodation space and the emission of carbon monoxide and water vapour,

Use of the water heater should only be made in harbour and also with the companionway hatch open. Neither of the gas appliances were tested as they are outside the scope of survey. Testing LPG gas systems should only be done by Gas Safe Marine engineers using certified test equipment.

w) Fire fighting equipment

There are four fire extinguishers seen on board. All are 1kg 5A 34B dry powder extinguishers. There is one in the forepeak dated 1998, one in the galley dated 2001 and another in the aft cabin dated 2001. There is also an automatic extinguisher the engine space which has fallen down and the date cannot be read. There are no up to date service record attached. There is also a fire blanket in the galley.

Fire extinguishers require annual inspections and discharge tests every five years. None of these extinguishers are worth discharge testing as recharge will cost more than new extinguishers. All should be replaced. The automatic extinguisher installed in the engine space must be a gas extinguisher with HFC227ea Clean Agent extinguishant. Powder type extinguishers should not be used in engine spaces as the fine powder can be sucked into a running engine and cause serious damage. *(See explanatory note 11)*

Recommendation

(Cat 1) Replace all the fire extinguishers.

x) Bilge pumping

A Whale Gusher double acting manual bilge pump is mounted inside the engine space and operated from the cockpit. It draws from a hose with a strum box in the bilge just forward of the companionway steps and discharges through the starboard topsides. The pump handle was not seen and the pump could not be tested without the handle. This should be found or replaced and the pump tested.

In the same bilge compartment is a Rule 2000 gallon per hour electric bilge pump which also discharges through the topsides and is switched at the main switch panel. This could be heard working when tested but there was no water to discharge. It would be recommended to occasionally introduce water into the bilge so that the pumps could be tested as working effectively.

Recommendation

(Cat 1) Find bilge pump handle and introduce water into bilge test to pumps for operation

y) Fit out

The fit out is executed in teak hardwood moulding and teak veneered plywoods. The hardwood joinery is finished in a satin varnish. The joinery is well executed with all panel works edged with solid wood lippings and no exposed end grains. The joinery is in generally good condition with all the hinges and latches secure and operable although some cupboard doors are difficult to open with the internal latches and finger holes.

The sole boards to the saloon are all plain plywood panels that are mostly screwed down with some loose panels with finger holes for lifting. Soles to the forepeak and aft cabin are part of the internal tray moulding and are in white gel coat. All the soles are covered with a blue short pile polypropylene commercial carpeting with a latex backing. This is not bonded down but relies on a good fit to the joinery to stay in place. The carpet is in fair condition but the backing is degrading into powder.

The upholstery to the saloon is in a light blue velour fabric over thick foam. This is ligjhtly worn and stained in places but serviceable and appears to be fire retardant. The same fabric but in a light tan is used for the sleeping cabins. The backs are buttoned but there are no piped seams or buttoning to the cushions so some have lost some shape. The windows all have matching blue cotton curtains on plastic curtain tracks and are in good order.

The coachroof head is finished in off white vinyl trimmed plywood panels and plain vinyl bonded to the GRP deckhead. All the vinyl linings are in a good condition and a recent replacement. The only defects are to the forward heads windows where leakage has caused the vinyl to become debonded. Most vessels of this age have sagging headlinings. Generally the fit out is in good condition for the vessels age and there is scope for upgrading with new soft furnishings

The accommodation is heated by a 3.2 kW Eberspacher D3L heater installed in the cockpit locker. This exhausts through the topsides and supplies warmed air via ducting to the saloon. The controller is on the engine space covers and is a simple thermostat. There is a panel and wiring for a programmable timer but this is not installed. The heater was powered up and it delivered warmed air effectively when tested although 3kw is a bit small for the size of the accommodation.

z) Additional equipment

The following equipment was seen on board the vessel. Inclusion in this list does not imply ant item is necessarily included in the sale inventory.

Plastimo main compass, good condition, no bubble
NASA Clipper depth display, working
Stowe Log/depth display, working
Stowe Wind speed and direction display, working
Navico spinner type depth sounder, working
Garmin GPSmap 120 navigator, working
Ratheon R 20X CRT radar display and 4kw 18” Pathfinder scanner, working
Silva S10 DSC VHF, MMSI & GPS enabled, working
Icom IC-M3 Euro handheld VHF, not tested
VDO Sumlog mechanical speed log display, not working,
VDO engine hours meter, assumed working
NASA CRT Video Navtex, not working
Tevion FM/iPod/MP3/CD player, working
Pair of speakers to saloon, working
Firdell Blipper radar reflector on mast
Brass cased clock and barometer on main bulkhead
Set cockpit cushions
Lee cloths to saloon berths
Red ensign and ensign staff
Boat hook and deck scrubber
15lb Bruce claw anchor on stemhead, chain and warp, unmeasured
Quantity of warps and fenders
Equipment handbooks
Windex wind direction and VHF antenna at masthead
Flares in waterproof canister, expired 1999, 2001 & 2007
Coil of hose
Quantity of galley utensils, crockery and cutlery
Mast climbing ladder
Telescopic spinnaker pole
Danbouy
Mercury 2.2hp two stroke outboard engine
Avon Redcrest inflatable dinghy
Bouyancy aids and harnesses
Teak folding leaf cockpit table for pedestal
First Aid Kit
Ball and cone day signal shapes
Blue canvas cockpit dodgers with name

4) **Summary of recommendations** This is a check list. Full details must be read and can be found in the body of the report. Page references are *(p#)*

Category 1 recommendations, corrected before vessel is put in commission.

(p17) Reinstate the side deck jackstays that are stowed in the cockpit locker
(p17) Fit light and line to lifebelts and mark with vessels name and identifier
(p18) Free up the seized forward heads compartment waste discharge valve
(p18) Replace both aft heads compartment flush water and discharge valves
(p19) Install a second hose clip and softwood bungs to each skin fitting
(p21) Fit pull cable to fuel valve to enable shut off from outside engine space
(p30) Repair tri-colour light and check supply or the bulb to steaming light.
(p30) Replace both flexible gas hoses and the regulator
(p31) Replace all the fire extinguishers.
(p31) Find bilge pump handle and introduce water into bilge test to pumps

Category 2 recommendations, attended to at the earliest opportunity.

(p8) Treat the blistered hull bottom by whatever method is most suitable
(p8) Rake out landing seam slot, clean, dry, prime and re-apply sealant
(p9) Repair the deep gouge to the port side topsides
(p11) Replace vinyl windows to sprayhood
(p13) Remove windows and replace glazing. Dry, treat and repair bulkheads
(p14) Replace the worn jaws to the mainsail outhaul clutch
(p15) Investigate switching and supply to the windlass and test for operation
(p16) Make access panels to enable access to the chainplate web frames.
(p16) Remove and re-bed the escutcheon plates around shroud chainplates.
(p18) Remove the redundant Sumlog propeller fitting and make good hull
(p20) Clean block of oil leakage and check for source, repair as necessary
(p20) Investigate the non-function of the revolutions counter.
(p20) Clean and investigate gearbox pipework for leakage and corrosion.
(p21) Replace the gearbox oils and filter
(p22) Replace Spurs blade and bearing or replace with disc cutter.
(p22) Replace hull anode and check bondings resistance of < 0.5 ohms
(p23) Clean and tighten the rudder stock gland and monitor for leakage
(p24) Monitor gooseneck joint and replace before it is in danger of failing
(p26) Remove and valet both the furling genoa and the furling mainsail
(p26) Service inner forestay and both hanked on headsails ready for use
(p27) Investigate the switching and supply to the shower pump out
(p27) Repair the collapsed hanging rail in the wet locker
(p29) Investigate the battery switching system and label for purpose
(p30) Check supply and bulb to chart reading light and fwd heads light.

5) Conclusions

Moody and Marine Projects had a good reputation for high quality manufacturing disciplines. These hulls were available with Lloyds hull construction certification and they were generally equipped with the best quality engineering and fittings available at the time. Moody struggled to compete with, and ultimately succumbed to competition from mainly French volume and budget boat builders. Moody is now owned by the German boat builders Hanse and is seen as one of their premium brands.

[redacted] is now over forty years old and there are a few typical forty year old boat issues. There will always be a gradual deterioration in the fabric of a vessel considering the hostile environment in which it has to live and the stresses and strains to which it is subjected. Her hull is relatively structurally sound but with high moisture readings and extensive but low level osmotic defects. The deck and hull to deck joint is all sound and in good order. The deck shows the usual defects with moisture absorption via the chainplates.

The keel is a secure attachment but showing uniform blistering of corrosion. There is also some flex in the aft landing beyond the keel fastenings. The rudder is sound and secure in its hangings with well engineered steering requiring some minor adjustment. The mast and spars are generally sound but with wear to the gooseneck. Both furling gear are in good order and the standing rigging is scheduled to be replaced. Running rigging has been replaced already.

The list of recommendations is very long and generally reflects a vessel that was of a high quality and specification when built, but has had very little upgrading made since then. There has also been a lack of recent maintenance and a preparedness to allow certain obvious defects to endure. The recommendations list also reflects the need to bring some of the equipment up to current safety standards and replacement of time expired components. There are also some unexplained electrical arrangements that need investigation.

Overall [redacted] is a poorly presented vessel that is showing her age, but she is in a mainly sound mechanical and structural condition apart from the identified defects. Once the priority items are attended to and some investment made in upgrading systems to current standards, she has the potential to give another 40 years of good service and could outlast contemporaries from less well regarded manufacturers.

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