fieldhouse yacht surveys

MELAN

Insurance Survey

Completed for
Client Name,
House,
Tottington Manor,
Edburton Road,
Town,
West Sussex,
POSTCODE

On 07/11/2014

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If this survey does not discuss a specific item, equipment or machinery, it is not covered by this survey. Every effort has been made to ensure the accuracy of the information presented within this report. The report is issued in good faith as a statement of facts ascertained at the time of the survey, during which due diligence and reasonable skill were exercised and reasonable care taken, using common professional practice and where available published guidelines or codes such as those published by the International Institute of Marine Surveying.

LAW AND JURISDICTION

This document is to be construed under English Law and English Law shall be used in interpreting the document and for resolving all claims or disputes arising out of or connected with the document.

1 INTRODUCTION

1.1 This is to certify that Nic Fieldhouse, Principal Surveyor of Fieldhouse Yacht Surveys, carried out an Insurance Survey on MELAN in accordance with instructions received from Client Name of House, Town, West Sussex.

1.2 The primary aim of this document is to report on the factual condition of MELAN at the time of the survey. Where the equipment has been inspected or tested and found to be in an unsatisfactory condition, recommendations for rectification, repair or replacement will be detailed in this report. These recommendations will be assigned one of the five categories detailed in Appendix 1 on page 36. For clarity, all recommendations will be printed in upper case and red font thus: RECOMMENDED.

1.3 Where reference is made to the condition, this must be considered in relation to the age of the vessel.

1.4 The vessel was inspected whilst ashore in the car park of Bosham village, West Sussex on Friday 7th November 2014.

1.5 The survey was conducted by Nic Fieldhouse, Principal Surveyor of Fieldhouse Yacht Surveys.

1.6 The survey was carried out in accordance with Fieldhouse Yacht Surveys Standard Terms and Conditions and with relevant codes of practice published by the International Institute of Marine Surveying.

1.7 Those present during the survey were:

Client Name, Client

Eur Ing Nic Fieldhouse BEng (Hons) CEng MIMechE AssocIIMS

Marine Surveyor, Fieldhouse Yacht Surveys.

Address 5 Sheepdown Close, Petworth, West Sussex, GU28 0BP

Email nic@fieldhouse-yacht-surveys.com

2 SUMMARY

MELAN was seen to be a good example of a late 1970s Westerly Longbow sailing vessel. The GRP hull seemed to be in good structural condition and retained a fair finish but with numerous and very small cosmetic blisters on the topsides.

The deck moulding, masthead rig, engine, domestic services and interior finish were generally all in serviceable condition.

2.1 TYPE A1 RECOMMENDATIONS

2.1.1 There were four **type A1 recommendations** that must be implemented before the vessel is relaunched. Please refer to Appendix 1 for a full description of the categories of recommendations used in this report.

2.1.2 A four step, hinging, welded stainless steel boarding ladder was secured to the hull moulding on the stern of the vessel. One of the stainless steel fasteners on the lower port mount was distorted. One of the fasteners on the lower starboard mount was missing. It is RECOMMENDED (type A1 recommendation) that these two fasteners are replaced with A4-grade stainless steel fasteners. It is likely that the missing fastener had corroded and subsequently sheared off. The other fasteners on the lower mounts of the ladder should therefore be withdrawn and inspected. They should be replaced if they are found to be corroded (see paragraph 5.3.7.1).

2.1.3 The three-bladed, fixed pitch, 14½" diameter bronze propeller was in good condition but was found to be loose on the 1" diameter stainless steel shaft. It is RECOMMENDED (type A1 recommendation) that the propeller is removed from the shaft. The shaft, woodruff key and internal taper of the propeller boss should be inspected for any damage that may have occurred whilst the propeller was loose. If any wear or fretting has occurred, the parts may need to be repaired or replaced (see paragraph 5.5.6.2).

2.1.4 The inboard shaft seal was inspected and found to be in poor condition, with cracking of the rubber visible in one area, as shown in Figure 8. It is RECOMMENDED (type A1 recommendation) that the rubber hose of the shaft seal is replaced (see paragraph 5.5.6.6).

2.1.5 The hose clips that secure the seal were in acceptable condition, but the inner two were found to be constructed from A2-grade stainless steel (Figure 8). It is RECOMMENDED (type A1 recommendation) that all of the hose clips are replaced with new A4 grade stainless steel clips when the work described in paragraph 5.5.6.6 is undertaken (see paragraph 5.5.6.7).

2.2 TYPE A2 RECOMMENDATIONS

2.2.1 There were thirteen **type A2 recommendations** that must be implemented before the vessel is taken cruising:

2.2.2 Two of the hoses were secured with a single stainless steel screw clip. These hoses included the heads sink outlet and the bilge pump outlet. It is RECOMMENDED (type A2 recommendation) that all hoses that have a skin fitting located near to or below the waterline are fitted with two hose clips at each end (see paragraph 5.1.7.5).

2.2.3 The engine oil pressure sounder behaved normally until the engine revs were dropped down from medium speed to tick-over. The oil pressure alarm then sounded continuously. It is RECOMMENDED (type A2 recommendation) that the cause of this is investigated and cured (see paragraph 5.5.4.8).

2.2.4 The alternator belt appeared to be slightly loose. It is RECOMMENDED (type A2 recommendation) that the belt tension is adjusted (see paragraph 5.5.4.9).

2.2.5 There was evidence that the exhaust hose had been very slightly damaged by chafing from the engine gear control cable, as shown in Figure 6. At the time of survey, the hose was still in contact with the gear cable and further wear is likely. It is RECOMMENDED (type A2 recommendation) that the exhaust hose is re-routed so that it does not chafe on the cable, or adequately protected by a piece of padding material (see paragraph 5.5.4.14).

2.2.6 The brass fittings of the return feed, located on top of the fuel tank were loose and were supported by a lump of Blu Tack, as shown in Figure 7. It is RECOMMENDED (type A2 recommendation) that the pipe fittings are tightened and adequately supported (see paragraph 5.5.5.4).

2.2.7 The chain was attached to the anchor by a stainless steel shackle, which was in good condition but was not seized in order to prevent the bolt from coming loose. It is RECOMMENDED (type A2 recommendation) that seizing wire is used to lock the shackle bolt, or the end of the thread should be peened over to prevent loosening. Stainless steel shackles are particularly prone to coming undone (see paragraph 5.6.1.2).

2.2.8 A steaming light and deck light unit was mounted half-way up the mast. The lamps did not function. It is RECOMMENDED (type A2 recommendation) that the steaming light is fixed (see paragraph 5.6.8.5).

2.2.9 It is RECOMMENDED (type A2 recommendation) that the bilge pump handle is tethered by a length of line in order to prevent its loss (see paragraph 6.1.3).

2.2.10 It is RECOMMENDED (type A2 recommendation) that the bilge pump is tested, with the inlet end of the hose temporarily placed in a bucket of water (see paragraph 6.1.4).

2.2.11 It is RECOMMENDED (type A2 recommendation) that two buckets (with lanyards) are stowed on board. These should be between 9 and 14 litres in capacity (see paragraph 6.1.5).

2.2.12 A fire blanket was stowed on board. It is RECOMMENDED (type A2 recommendation) that the blanket is securely attached in a suitable location and is installed within two arm lengths of the cooker (see paragraph 6.3.3).

2.2.13 There was no Carbon Monoxide alarm installed on MELANTHE. It is RECOMMENDED (type A2 recommendation) that one is procured and mounted in an appropriate location (see paragraph 6.4.1).

2.2.14 One flotation light (no batteries) was secured to the life ring. It is RECOMMENDED (type A2 recommendation) that batteries are fitted to the light. The lamp should then be tested (see paragraph 6.8.2).

2.3 TYPE C RECOMMENDATIONS

2.3.1 There were four **type C recommendations** that do not require immediate attention but are to be dealt with within a specified time period:

2.3.2 A number of areas of the gel-coat on the topsides were found to have a large number of small blisters. These blisters were typically about 3 mm in diameter and all were a flattened dome shape. These were generally located close to the waterline but were also found to be located in other areas, particularly below the scuppers of the toe rails. The majority of the blisters located near to the waterline were intact, but a small number were found to be broken, leaving very small ‘half-moon’ scars on the surface of the gel-coat. A number of the blisters were broken open. Each one contained a very small amount of clear fluid which smelled of vinegar. This evidence suggests that the

blisters have occurred due to hydrolysis within the hull material, commonly termed as ‘osmosis’. The material disclosed beneath the surface of the broken blisters was a smooth, white resin surface, with no evidence of glass fibre or fibre pattern. See Figure 3 for an example of two of the blisters. Referring to the publication ‘Repairs to Blisters in Glass Fibre Hulls [British Plastics Federation, October 1984], these blisters are of type 3A, which occur in craft with double gel-coats. This condition whilst unsightly is not structurally significant. In the case of broken blisters (including those with ‘half-moon’ scars), rectification should be undertaken at the earliest opportunity. It is RECOMMENDED (type C recommendation with an implementation time of one year) that any blisters that are broken or readily breakable should be thoroughly cleaned out and dried. The shallow cavity should then be filled with epoxy filler (see paragraph 5.1.2.6).

2.3.3 The stainless steel fastenings that secure the rudder tube to the hull moulding (lower bearing) were inspected from the cockpit aft locker. One of the fasteners was found to be partially corroded. They could not be fully accessed for hammer testing or closer inspection. There was no evidence of water ingress through this area. It is RECOMMENDED (type C recommendation with an implementation time of one year) that the corroded fastener is withdrawn and inspected for wasting due to corrosion. If corroded, it should be replaced with an A4-grade stainless steel fastener (see paragraph 5.1.6.3).

2.3.4 There was a stainless steel collar fitted around the upper end of the rudder stock. This collar was located just above the cockpit sole and above the upper rudder bush. The function of the collar was to act as a rudder end stop, in order to prevent the rudder blade from swinging too far over when going astern. The collar also acts as a thrust bearing, supporting the rudder in the vertical direction and preventing the rudder assembly from dropping and falling out. The collar was in sound condition but the condition of the stainless steel nut and bolt that hold the collar in place was unknown. The nut & bolt were hammer tested and found to be securely attached. It is RECOMMENDED (type C recommendation with an implementation time of one year) that the bolt is withdrawn and inspected for damage or deformation. If there is any evidence of damage or significant wear, the bolt should be replaced (by one made from A4-70 or A4-80 grade stainless steel). Note that these bolts have been known to shear on other Westerly boats (see paragraph 5.1.6.6).

2.3.5 The cockpit hatch was located on the centreline of the cockpit. The moulded GRP sliding hatch and two-piece doors were inspected and found to be sturdily built and in satisfactory condition. A substantially constructed stainless steel security mechanism was fitted to the GRP sliding hatch. This fabrication was not working correctly. It is RECOMMENDED (type C recommendation with an implementation time of one month) that the locking mechanism is fixed (see paragraph 5.6.10.1).

2.4 TYPE D RECOMMENDATIONS

2.4.1 There was one **type D recommendations** whose repair may be left to the owner's convenience:

2.4.2 There were a number of cracks around some of the stanchion bases. It is RECOMMENDED (type D) that these cracks are cut out and repaired in order to prevent moisture entering the core of the deck (see paragraph 5.3.2.3).

3 SCOPE & LIMITATIONS

3.1 The vessel was inspected while she lay ashore in a cradle. There was good, all-round access to the exterior of the hull. The only minor obstructions were those presented by three supporting props on each side, one prop at the bow and one placed at the stern, just forward of the propeller. Access to the bottom of the keel was limited to the parts not resting on the two chocks.

3.2 At the time of hull survey the ambient temperature was approximately 12℃, with 100% cloud cover, a fresh wind and occasional showers. There had been heavy rainfall in the 24 hours preceding the survey.

3.3 Internal inspection was limited to the areas that are normally accessible directly or through lockers, inspection hatches, removable panels, etc. No part of the vessel was dismantled; no bolts were removed for inspection and no linings removed, except to access the upper bearing of the rudder stock in the cockpit. Consequently, any part of the vessel, her equipment or fittings, which were unexposed or inaccessible, cannot be confirmed to be free from defect.

3.4 All tanks were inspected where visible but not internally inspected and they have not been pressure tested; their contents have not been tested for contamination.

3.5 Window hatches and external doors have not been tested for water tightness.

3.6 We have not inspected fibreglass laminate, woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are, therefore, unable to report that any such part of the structure is free from defects, rot or deterioration.

3.7 The vessel and her equipment were not assessed for design or suitability for any particular purpose, or compliance with any rules, regulation, standard or code.

3.8 Note that the terms “serviceable” or “serviceable condition”, as used in the report, means that the item remained usable, despite possible wear or deterioration. The item may nevertheless require maintenance or replacement in due course.

3.9 No dismantling of the engine took place and so the internal condition of the engine cannot be commented upon. Components hidden from view, such as the sump, crankshaft, camshafts, pistons, valves and cylinder head gaskets could not be examined for latent defects. No compression tests of the cylinders took place. Comments can only be made with regard to the general condition of the engine on the day of the inspection. No guarantee can be made regarding the life expectancy of the engine.

4 THE VESSEL

4.1 DETAILS

Name	MELAN
Craft Identification Number	SOUXXX
Hull Identification Number	XXX (found on part III certificate & Lloyd's certificate of hull construction)
SSR	XXX
Official Number	XXX
Registered Tonnage	$6\ ^{87}/_{100}$
Built by	Westerly Marine Construction Ltd
Model	Longbow
Type	Sloop rigged, fin keel sailing yacht
Build date	August 18th 1977
Delivery date	December 1977
Engine manufacturer & Model	Beta D1005
Engine type	4 stroke, 3 cylinder diesel, naturally aspirated
Engine power (published)	28 BHP @ 3600 rpm

Table 1: Vessel Details

4.1.1 MELAN was seen to be a Westerly Longbow - a masthead rigged sailing yacht with a cast iron fin keel. She was built by Westerly Marine Construction Ltd in 1977.

4.1.2 The hull of MELAN was moulded in one piece with hand laid GRP, made up of polyester resin, mixed-strand fibreglass mat and woven rovings, covered with a white pigmented gel-coat. The fin keel was made from cast iron and was fastened to the hull with stainless steel studs and nuts. The hull was seen to be stiffened internally by a GRP Internal Moulding and also by longitudinal stringers and transverse floors.

4.1.3 The cockpit, deck and superstructure were of moulded GRP with a balsa core. Hull to deck join was of the shoebox type. The deck moulding was finished with a white pigmented gel-coat with Treadmaster non-slip covering the decks and painted non-slip on the coachroof.

4.1.4 MELAN had a semi-balanced spade rudder constructed from a stainless steel rudder stock encapsulated in a hollow GRP moulding. She had a self-draining cockpit and wheel steering. She had a masthead sloop rig, featuring a deck-stepped mast, a slab reefing mainsail, roller furling genoa and cruising chute.

4.1.5 The accommodation of MELAN was the 'Longbow aft galley' variation, with a double berth, wet lockers and enclosed heads forward. The saloon had a settee berth on each side, with the saloon table running fore-aft and positioned slightly to port. The galley space was along the starboard side, just next to the companionway hatch. There was a quarterberth beneath the port cockpit seating.

4.1.6 A Beta D1005 (marinised Kubota) three cylinder diesel engine, with fresh water cooling, drove a three-bladed, fixed pitch propeller through a reduction gearbox. Engine control was via a single lever, giving forward & reverse gears and throttle control, mounted on the starboard side of the steering binnacle. One stainless steel fuel tank was located under the cockpit sole, accessible from the engine access cover mounted in the cockpit sole.

4.2 DIMENSIONS

Dimension	Metres	Feet / inches
Length Overall	9.45	31 feet and 00 inches
Length on Waterline	7.62	25 feet and 00 inches
Beam	2.90	9 feet and 6 inches
Draft	1.37	4 feet and 6 inches
Displacement	4264 kg	9400 lb
Ballast	1905 kg	4200 lb

Table 2: Vessel Dimensions (Published Data)

4.3 VESSEL'S NAME

4.3.1 MELAN of Southampton had her name positioned across her stern in large self-adhesive blue lettering. Smaller lettering was also used to apply her name to the forward end and sides of the coachroof.

4.3.2 Her name was also applied in white lettering, sewn onto the blue canvas cockpit dodgers, positioned on the guard rails on both sides of the cockpit.

4.4 CRAFT IDENTIFICATION NUMBER

4.4.1 The CIN was moulded into to the starboard side of the vessel's transom. The number was SOU xxx, as shown in Figure 1.

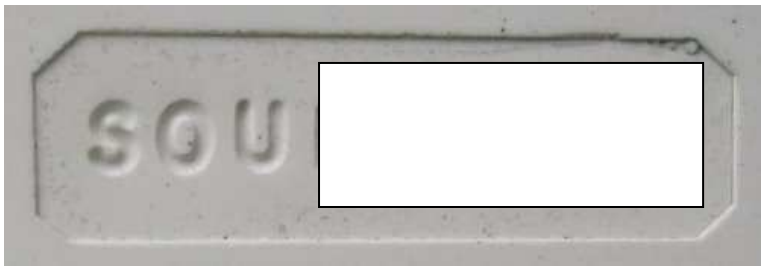

Figure 1: Craft Identification Number of MELAN

4.5 OFFICIAL NUMBER

4.5.1 The Official Number was stamped onto a stainless steel plate, which was secured to the hull moulding at the aft end of the cockpit. The number was xxx, as shown in Figure 2.

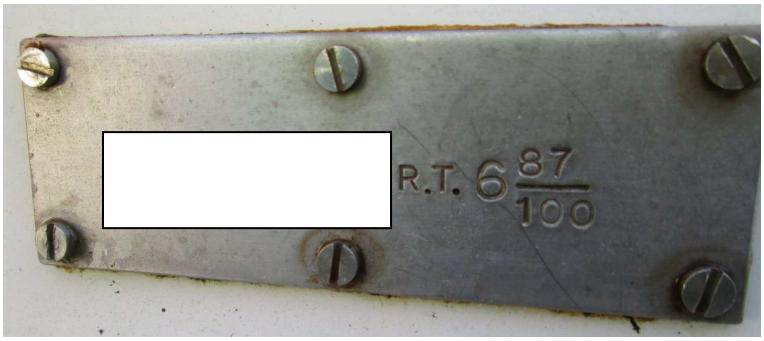

Figure 2: Official Number of MELAN

5 THE SURVEY

5.1 HULL EXTERIOR

5.1.1 Material & Details of Construction

5.1.1.1 The hull of MELAN was moulded in one piece with hand laid GRP, made up of polyester resin, mixed-strand fibreglass mat and woven rovings, covered with a white pigmented gel-coat. The fin keel was made from cast iron and was fastened to the hull with stainless steel studs and nuts.

5.1.1.2 The hull was sighted from a distance fore and aft and visually inspected all round. Her lines were symmetrical, fair and true, with no signs of distortion, hard spots or flat areas.

5.1.2 Topsides

5.1.2.1 A narrow band of dark blue decorative PVC tape had been applied to the port & starboard topsides, positioned just below the teak rubbing strake. This was in good cosmetic condition.

5.1.2.2 The topsides were inspected visually. The laminate was found to be in acceptable condition with no signs of major trauma or stress cracking. There were small cosmetic scuff and scratch marks from mooring fenders. There was no evidence of gel-coat cracking on the topsides due to impact with pontoons or from heavy loading by mooring fenders.

5.1.2.3 The gel-coat was tarnished over the majority of the topsides and there was a slight yellow-brown staining above the waterline. The topsides should be cleaned and polished with a suitable marine-grade polish.

5.1.2.4 There were various small chips on the surface of the topsides. These had been repaired with white gel-coat. The quality of these repairs was satisfactory and they were only evident by the slight miss-match in gel-coat colour.

5.1.2.5 The gel-coat around the engine exhaust skin fitting, located on the port side of the stern, had numerous small cracks. These cracks were not structurally significant.

5.1.2.6 A number of areas of the gel-coat on the topsides were found to have a large number of small blisters. These blisters were typically about 3 mm in diameter and all were a flattened dome shape. These were generally located close to the waterline but were also found to be located in other areas, particularly below the scuppers of the toe rails. The majority of the blisters located near to the waterline were intact, but a small number were found to be broken, leaving very small ‘half-moon’ scars on the surface of the gel-coat. A number of the blisters were broken open. Each one contained a very small amount of clear fluid which smelled of vinegar. This evidence suggests that the blisters have occurred due to hydrolysis within the hull material, commonly termed as ‘osmosis’. The material disclosed beneath the surface of the broken blisters was a smooth, white resin surface, with no evidence of glass fibre or fibre pattern. See Figure 3 for an example of two of the blisters. Referring to the publication ‘Repairs to Blisters in Glass Fibre Hulls [British Plastics Federation, October 1984], these blisters are of type 3A, which occur in craft with double gel-coats. This condition whilst unsightly is not structurally significant. In the case of broken blisters (including those with ‘half-moon’ scars), rectification should be undertaken at the earliest opportunity. It is RECOMMENDED (type C recommendation with an implementation time of one year) that any blisters that are broken or readily breakable should be thoroughly cleaned out and dried. The shallow cavity should then be filled with epoxy filler.

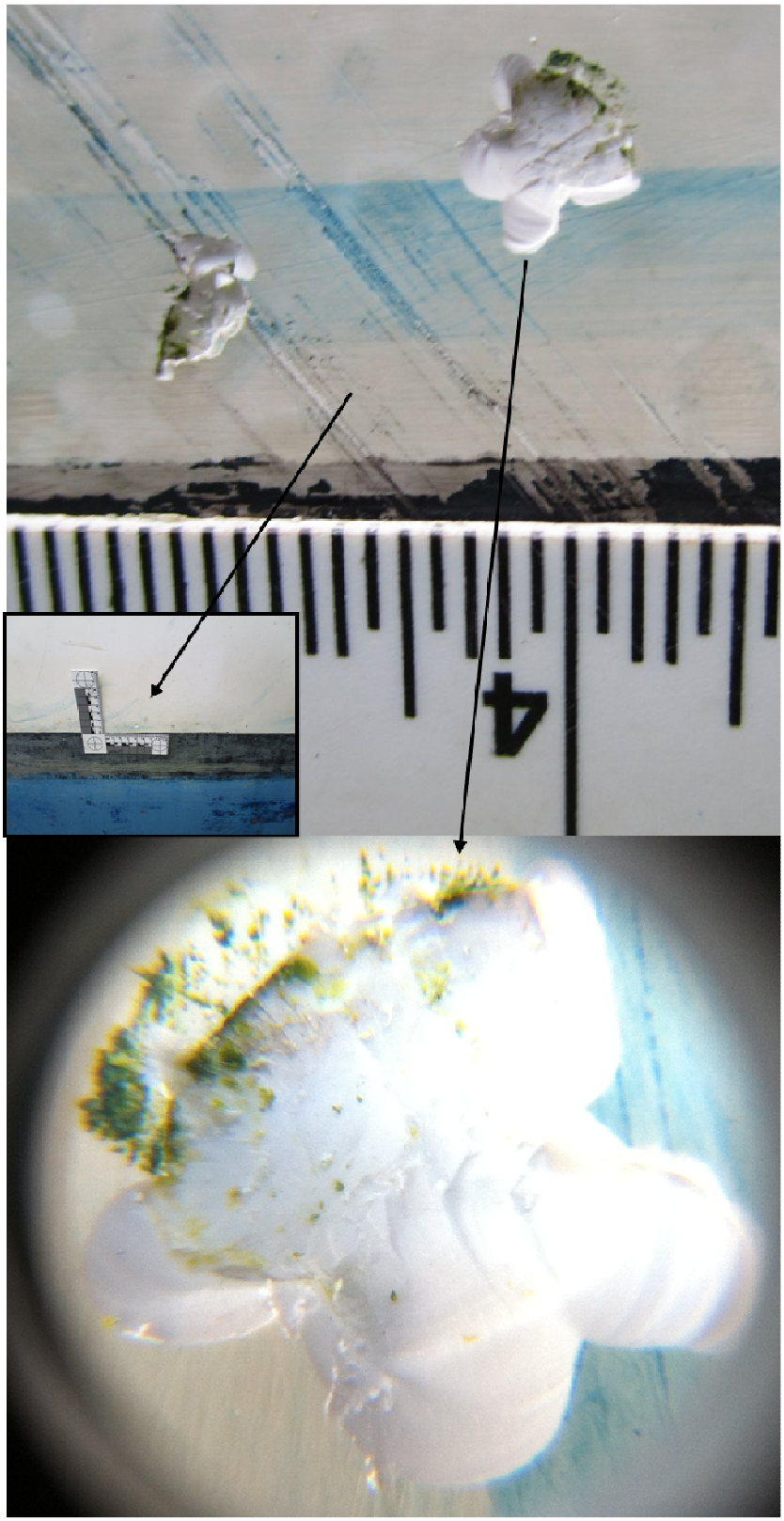

Figure 3: Opened up blisters, located just above the waterline

5.1.2.7 The teak rubbing strips were found to be in good condition and well secured to the hull. All fixing through-bolts were covered with wooden plugs. The scarph joints along each side were beginning to pull away from the hull, with one joint on the port side having been re-secured with a brass woodscrew.

5.1.3 Hull Below the Waterline

5.1.3.1 The blue ablative type antifouling paint below the waterline was in need of a new application. Numerous coats of the antifouling have built up, giving a rough surface and these were flaking in some areas.

5.1.3.2 A band of dark blue hard antifouling was applied to the hull along the waterline. This boot topping was in need of a new application.

5.1.3.3 Beneath the antifouling it was found that the hull had been treated with a number of coats of light grey coloured epoxy resin. The Broker's information sheet stated that this had been applied by Osmotech of Southampton in 1999. This coating was found to be well applied and was generally bonding well to the underlying surface.

5.1.3.4 The antifouling was scraped off in a number of areas in order to inspect the condition of the epoxy gel-coat. The hull was inspected all over, except where surfaces were hidden behind the shores. Particular attention was paid to the areas around the skin fittings and around the keel root. There was no evidence of blistering or other damage attributable to water penetration. No evidence of scratching or chipping of the hull was found.

5.1.4 Moisture Readings

5.1.4.1 Moisture readings were taken using a Tramex Skipper Plus capacitance type moisture meter. The meter was set to range 2, which measures deep into the layup. Figures quoted are from the meter's percentage H_20 scale. Note that by convention, moisture meters are calibrated for timber, so the percentage moisture readings are not directly applicable to GRP. The true moisture content of GRP is very approximately 10% of those quoted.

5.1.4.2 Readings were taken both above and below the waterline in order to obtain a comparison. Note that high moisture content is not generally a structural defect and is to be expected in older boats. Where some moisture has been absorbed, the likelihood of moisture related problems occurring are higher. When this occurs, the actual state of the laminate cannot be completely guaranteed without destructive testing and chemical analysis. The opinion given in this survey report is based on all the evidence available at the time but without destructive testing.

5.1.4.3 Moisture readings taken on the topsides were between 15 and 23, with the highest readings measured at the waterline and in the lower stem. These levels indicate a medium moisture level but with high readings near to the waterline.

5.1.4.4 Readings taken of the hull below the waterline were between 20 and 25, with the highest readings found in the lower bilges. These readings indicate that the hull laminate below the waterline has a fairly high moisture content. Note that the older orthophthalic resins used prior to the mid 1990's tend to retain moisture for a long period.

5.1.4.5 Readings taken of the rudder blade were between 25 and 30. This high level of moisture may be partly attributed to moisture held within the cavity between the two halves of the blade.

5.1.4.6 To limit the moisture levels in the hull laminate, the boat should ideally be stored ashore for a few months each winter. The owner should endeavour to keep the bilges as dry as possible. Sources of any leakage into the vessel should be found and cured. When the vessel is to be left unattended for more than a few days, the sole boards and internal locker covers should be opened up to allow the moisture in the bilges to evaporate.

5.1.5 Keel

5.1.5.1 The fin keel was found to be constructed from cast iron and fastened to the hull using stainless steel studs and nuts. The studs had two nuts fitted, allowing the nuts to be locked against each other. The nuts had large stainless steel backing pads.

5.1.5.2 The fin keel was inspected and no evidence of hard grounding or impact was found. It was hammer tested and was found to be treated with a thin layer of filler material in some areas.

5.1.5.3 The hull to keel join was inspected. The stopping compound was found to be in acceptable condition, but corrosion weeping was seen to be coming from parts of the join.

5.1.5.4 No evidence of lateral movement of the keels was found.

5.1.5.5 See section 5.2.4 for details of the inspection of the keel studs and fastenings.

5.1.6 Rudder & Steering

5.1.6.1 MELAN had a semi-balanced spade rudder constructed from a stainless steel rudder stock encapsulated in a hollow GRP moulding. It was inspected visually and found to be in serviceable condition and free from damage or cracks.

5.1.6.2 The stainless steel rudder stock was inspected where access allowed. The visible portions of the stock were found to be free of pitting corrosion or evidence of cracking. It should be noted that the portions of the rudder stock within the rudder tube and within the blade could not be accessed for inspection; therefore the condition of the stock cannot be guaranteed.

5.1.6.3 The stainless steel fastenings that secure the rudder tube to the hull moulding (lower bearing) were inspected from the cockpit aft locker. One of the fasteners was found to be partially corroded. They could not be fully accessed for hammer testing or closer inspection. There was no evidence of water ingress through this area. It is RECOMMENDED (type C recommendation with an implementation time of one year) that the corroded fastener is withdrawn and inspected for wasting due to corrosion. If corroded, it should be replaced with an A4-grade stainless steel fastener.

5.1.6.4 The stainless steel fastenings that secure the rudder tube to the deck moulding (upper bearing) were inspected from the cockpit. When hammer tested, they were found to be securely attached and in serviceable condition.

5.1.6.5 Lateral and fore-aft loads were applied to the rudder blade which revealed minimal wear in the rudder bearings.

5.1.6.6 There was a stainless steel collar fitted around the upper end of the rudder stock. This collar was located just above the cockpit sole and above the upper rudder bush. The function of the collar was to act as a rudder end stop, in order to prevent the rudder blade from swinging too far over when going astern. The collar also acts as a thrust bearing, supporting the rudder in the vertical direction and preventing the rudder assembly from dropping and falling out. The collar was in sound condition but the condition of the stainless steel nut and bolt that hold the collar in place was unknown. The nut & bolt were hammer tested and found to be securely attached. It is RECOMMENDED (type C recommendation with an implementation time of one year) that the bolt is withdrawn and inspected for damage or deformation. If there is any evidence of damage or significant wear, the bolt should be replaced (by one made from A4-70 or A4-80 grade stainless steel). Note that these bolts have been known to shear on other Westerly boats.

5.1.6.7 The six spoke Whitlock stainless steel and leather sheathed wheel was inspected and found to be adequately secured to the cockpit structure via a white aluminium binnacle.

The wheel operated with full and free movement from lock to lock.

5.1.6.8 The steering gear was driven by a chain & push-rod drive system. The parts of the mechanism that were located in the steering binnacle were not accessible for inspection.

5.1.6.9 The aluminium steering arm was adequately secured to the rudder stock by stainless steel fastenings. The steering arm, push rod and fastenings were inspected and found to be free of corrosion and well secured.

5.1.6.10 The upper end of the rudder stock was machined to a square cross section in order to provide a positive location for an emergency tiller. The stainless steel and varnished timber emergency tiller was tested and was found to fit on to the end of the stock.

5.1.7 Skin Fittings and Valves

5.1.7.1 The skin fittings were all in serviceable condition. All fittings on or below the waterline were bronze or dezincification resistant brass (apart from the plastic speed impeller & depth transducer) and showed no signs of dezincification.

5.1.7.2 No skin fittings or valves were dismantled as part of the survey but the following tests were performed:

- Examination from outside and inside the vessel
- All valves opened and closed to their full extent
- Where accessible, the fixing bolts and nuts were hammer tested
- The through-hull fittings and valves bodies were hammer tested
- The fittings were aggressively tested to assess their security of attachment to the hull
- Where accessible, hose clips were inspected and hoses were aggressively tested

5.1.7.3 Figure 4 and Table 3 below show the location and function of the skin fittings, together with the condition of the valves, hoses and clips. The items in red text in Table 3 indicate a defect or poor condition of the items and are addressed in the recommendations below.

5.1.7.4 There was clear access inside the vessel to all valves.

5.1.7.5 Two of the hoses were secured with a single stainless steel screw clip. These hoses included the heads sink outlet and the bilge pump outlet. It is RECOMMENDED (type A2 recommendation) that all hoses that have a skin fitting located near to or below the waterline are fitted with two hose clips at each end.

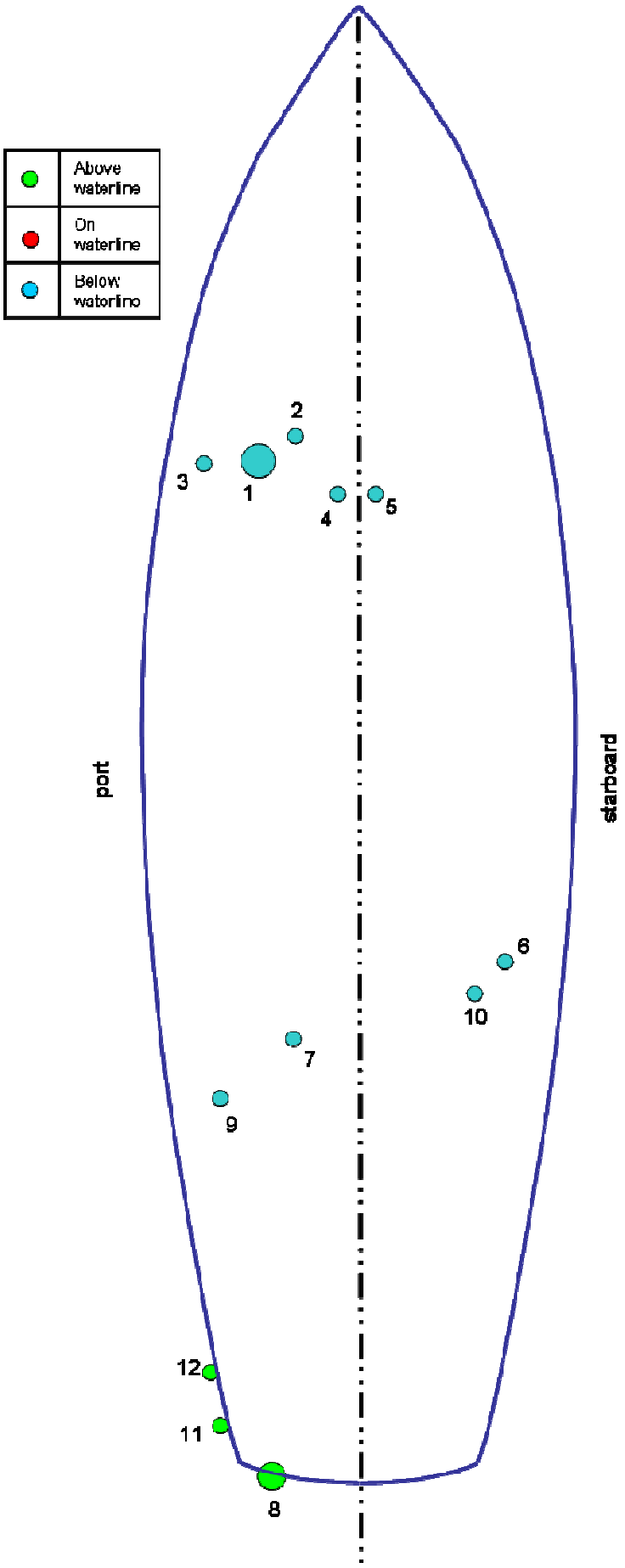

Figure 4: Location of skin fittings (plan view looking from above)

#	Function	Above / Below W/L	EXTERNAL		INTERNAL								Notes
			Skin Fitting		Valve			Hose		Clips			
			Mat.	Cond.	Type	Mat.	Cond.	Reinf.	Cond.	#	Mat.	Cond.	
1	Heads outlet	B	Br	✓	Blakes	Br	✓	✓	✓	2	ss	✓	
2	Heads inlet	B	Br	✓	Blakes	Br	✓	✓	✓	2	ss	✓	
3	Heads sink outlet	B	Br	✓	90º	Br	✓	✓	✓	1	ss	✓	See para 5.1.7.4
4	Depth transducer	B	Pl	✓	N/A								
5	Speed impeller	B	Pl	✓	N/A								
6	Galley sink outlet	B	Br	✓	90º	Br	✓	✓	✓	2	ss	✓	
7	Engine cooling intake	B	Br	✓	90º	Br	✓	✓	✓	2	ss	✓	
8	Engine exhaust & coolant outlet	A	Br	✓	None			✓	✓	2	ss	✓	
9	Cockpit drain port	B	Br	✓	Blakes	Br	✓	✓	✓	2	ss	✓	
10	Cockpit drain stbd	B	Br	✓	Blakes	Br	✓	✓	✓	2	ss	✓	
11	Bilge pump (manual) outlet	A	Br	✓	None			✓	✓	1	ss	✓	See para 5.1.7.4
12	Gas cylinder locker drain	A	Br	✓	90º valve. Seized open, but not required			Copper pipe	✓	N/A			

W/L	Waterline	Pl	Plastic
Mat.	Material	ss	Stainless Steel
Cond.	Condition	ms	Mild Steel
Br	Bronze / Brass	Zn	Zinc

Table 3: Function and condition of skin fittings, valves, hoses and clips

5.1.8 Anodes

5.1.8.1 A zinc pear anode was through-bolted to the hull, positioned near to the propeller, on the port side of the hull. The steel fastening studs were in good condition. The anode was 70% intact.

5.1.8.2 The electrical connection between the anode and the stern bearing was tested with a multimeter and the resistance found to be 0.3 Ω. The resistance between the anode and the propeller and shaft was found to be 0.3 Ω. The resistance between the anode and the rudder stock was found to be 0.3 Ω. The maximum recommended resistance should be 1.0 Ω.

5.1.8.3 Zinc anodes should be replaced when they are approximately 50 to 60% wasted.

5.2 HULL INTERNAL STRUCTURE

5.2.1 Internal Moulding and Stiffening

5.2.1.1 Within the saloon area and forepeak there were a number of removable sole boards. These were lifted in order to inspect the internal hull and stiffening structure. Access to the hull structure was also gained by lifting the seats in the saloon area, lifting the bunk covers in the forepeak & quarterberth and also via the engine compartment.

5.2.1.2 The plywood sole boards were supported by a GRP Internal Moulding, finished in white gel-coat. This moulding also formed the forepeak bunk structure, the quarterberth structure and also the frames of the saloon seating, all the way up to waist height. The Internal Moulding was secured to the hull and plywood locker sides by fibreglass tabbing. As far as could be ascertained, it was well bonded to the hull moulding.

5.2.1.3 The visible gel-coat surfaces of the Internal Moulding were in acceptable cosmetic condition. The bilges were acceptably clean, with no evidence of engine oil spillage or flooding.

5.2.1.4 In addition to the Internal Moulding, the hull was seen to be stiffened internally by plywood and foam-filled glass fibre longitudinal stringers and transverse floors. Further

reinforcing was provided by the bulkheads. In areas that could be accessed for inspection, there was no evidence of separation of the bulkheads, stringers or floors from the hull.

5.2.1.5 The internal grey hull paint application was generally in acceptable condition. There was some green paint applied to the lower bilges, around the keel fasteners. This paint was old and worn.

5.2.1.6 Some of the lockers in the forepeak had been painted with red paint. This had been carried out to a poor standard.

5.2.1.7 It was noted that the base of the mast compression post and surrounding internal hull surface had been painted with green paint. This suggests that the base of the compression post or surrounding structure may have been repaired or stiffened in the past. There was no other evidence to indicate that repair work was carried out in this area.

5.2.2 Bulkheads

5.2.2.1 Where accessible, the two main teak-faced plywood bulkheads were inspected and found to be in satisfactory condition with no evidence of wood rot or delamination.

5.2.2.2 Where accessible, the attachment of the hull & deck to the bulkheads was inspected. The bulkheads were secured to the hull moulding and the deck moulding by fibreglass tabbing. Where accessible, the integrity of the tabbing was inspected and found to be free of de-bonding, cracks or movement.

5.2.3 Engine Beds

5.2.3.1 The engine beds were constructed from vertical plates of solid GRP. These were secured to the hull by GRP tabbing. The engine was secured to the plates via L-section mild steel brackets. The mild steel brackets and mild steel fasteners were in acceptable condition and well secured. The vertical GRP plates were examined and found to be sturdily built and were free of signs of cracks or deformation.

5.2.4 Keel Studs

5.2.4.1 The cast iron keel was fastened to the hull by more than nineteen A4 grade stainless steel studs and nuts. Not all of the fasteners could be accessed for inspection.

5.2.4.2 Where accessible for inspection, all studs were found to be secured with two nuts. All nuts were backed by stainless steel plates.

5.2.4.3 The accessible fastenings were inspected and found to be free of significant corrosion. When hammer tested, they were found to be securely fastened.

5.3 DECK AND EXTERNAL FITTINGS

5.3.1 Hull / Deck Join

5.3.1.1 The deck was joined to the hull by the shoe box joining method. The external joint was concealed behind a teak rubbing strip running the full length of the vessel and across the stern.

5.3.1.2 Internally, the hull to deck joint was glassed over to provide additional strength. The teak rubbing strip was bolted through the hull to deck join.

5.3.1.3 As far as could be ascertained, the hull to deck joint appeared to be sound and in areas that could be accessed for inspection, there was no evidence of water ingress to

the vessel interior through this joint.

5.3.2 Deck Moulding

5.3.2.1 The deck moulding was a balsa and plywood cored GRP composite, finished with white pigmented gel-coat. It incorporated the decks, coachroof and cockpit. Structurally the deck seemed to be in serviceable condition, with no signs of damage or delamination between core and skin.

5.3.2.2 Large areas of the gel-coat were slightly degraded by UV exposure, with crazing over the some exposed parts of the deck moulding. There were numerous scuff & scratch marks and a number of small chips. The gel-coat was generally dull and in need of a polish.

5.3.2.3 There were a number of cracks around some of the stanchion bases. It is RECOMMENDED (type D) that these cracks are cut out and repaired in order to prevent moisture entering the core of the deck.

5.3.2.4 The vessel's toe rails were incorporated into the deck moulding. These were in acceptable cosmetic condition.

5.3.2.5 At the time of the survey the external surfaces of the deck and coachroof were damp, therefore moisture readings of the deck & coachroof structure could not be taken.

5.3.2.6 The integrity of the deck structure was checked by applying the Surveyor's weight to the deck surface. No excessive deformation was noted.

5.3.2.7 A non-slip surface on the side decks and foredeck was provided by a Treadmaster material. This was found to be in acceptable condition, but was beginning to lift in some areas. The coachroof was treated with an application of light grey anti-slip paint. This had been applied to a good standard and was in acceptable condition.

5.3.3 Cockpit

5.3.3.1 The cockpit floor and coaming were all in sound condition. There were numerous small stress cracks in the gel-coat. Large areas of the gel-coat were slightly degraded by UV exposure, with crazing over the most exposed parts of the moulding.

5.3.3.2 There were numerous blisters (some broken) in the gel-coat, located at the outboard edges of the cockpit seating. These often occur where dirt and moisture are allowed to gather for long periods.

5.3.3.3 There were a total of three storage lockers in the cockpit. In the port cockpit locker there was a plywood storage compartment for the storage of two LPG (butane) gas cylinders. See section 5.6.5 for details of the inspection of the gas equipment.

5.3.3.4 The lids, hinges and latches of the three lockers were in good working order.

5.3.3.5 There was one engine / stern bearing access cover constructed from GRP and located under the cockpit sole board. This cover gave access to the diesel fuel tank, the fuel shut-off valve, the stern bearing assembly and the aft end of the engine & gearbox. The latches of this lid were in good working order.

5.3.3.6 The diesel filling point was located just aft of the cockpit coaming, close to the aft port corner. The filler cap was not suitably labelled. The cap was removed in order to inspect the fibre sealing washer. The washer was in acceptable condition.

5.3.3.7 The cockpit seats were finished with timber slats. These were in good condition.

5.3.3.8 The timber cockpit sole board was in serviceable condition.

5.3.3.9 Access to the main cabin was from the cockpit hatch, located on the centreline of the cockpit. The moulded GRP sliding hatch and two-piece doors were inspected and found to be in satisfactory condition.

5.3.4 Chain Locker & Bulkhead

5.3.4.1 Chain from the locker in the forepeak was fed to the deck through a hawse pipe. The locker was inspected and found to be adequately attached to the hull and free of damage. The anchor locker was accessed from inside the forepeak, located beneath the berth.

5.3.5 Hatches, Windows and Ventilation

5.3.5.1 One aft hinging Lewmar hatch (480 x 480 mm opening) was installed in the roof of the fore-peak. The size of the hatch meets the recommendation for the minimum dimension to allow escape in an emergency, which is 380mm [BS EN ISO 9094-1:2003, Small Craft - Fire Protection]. It was found to be securely attached. The polycarbonate window material was crazed but in acceptable condition. The aluminium frame, hinges and latches were in good working order but the red locking tab on the port latch was missing.

5.3.5.2 A total of four inward opening, rectangular windows were installed in the coachroof of MELAN. These Gebo hatches were constructed from polycarbonate in aluminium frames. Two were in the fore-peak, one in the fore-peak heads compartment and one in the starboard wet locker, opposite the heads compartment. They were in serviceable condition, and showed no signs of water ingress.

5.3.5.3 There were four fixed toughened glass windows in the sides of the coachroof, located in the saloon area. These were adequately sealed into the coachroof sides. There was no evidence of water ingress around these windows.

5.3.5.4 There were three stainless steel ECS vents located on the vessel: one in the roof of the wet locker area, one in the roof of the heads compartment and one in the roof of the saloon, starboard side. All were in good condition.

5.3.5.5 There were two dorado vents mounted in the saloon roof. Both were in serviceable condition with no evidence of UV degradation on the surfaces of the vent mouldings.

5.3.6 Deck Fittings and Equipment

5.3.6.1 There were five aluminium mooring cleats: Two on the aft deck, one large on the centre of the fore-deck and two at the sides of the foredeck. The deck cleats were inspected and found to be adequately secured to the deck. Where accessible for inspection, the backing pads of the cleats were found to be in acceptable condition and generally free of corrosion or distortion.

5.3.6.2 There were two stainless steel fairleads mounted to each side of the foredeck. These were inspected and found to be free of damage and adequately secured to the deck moulding.

5.3.6.3 A total of four hardwood grab rails were located on top of the saloon coachroof. They were in acceptable condition with all wooden plugs intact and securely mounted.

5.3.6.4 The vessel was fitted with a pulpit, side stanchions and pushpit.

5.3.6.5 The pulpit was a four point, deck mounted unit, constructed of 1” outside diameter stainless steel tube and was in good order and well secured to the deck moulding.

5.3.6.6 The 620 high side stanchions were constructed from solid tapered aluminium and fitted with twin 4mm diameter 1x19 construction upper and lower safety wires (the lower

starboard wire was 5mm diameter). Each post was secured to the deck via a cast aluminium base. Each stanchion base was bolted down by three stainless steel bolts. The stanchions, bases and safety wires were found secure and generally in good order.

5.3.6.7 The pushpit was a four point, deck mounted unit, constructed from 1" outside diameter stainless tubular steel construction and was found secure and in good order.

5.3.7 Boarding Ladder

5.3.7.1 A four step, hinging, welded stainless steel boarding ladder was secured to the hull moulding on the stern of the vessel. This ladder hinged down to and below the waterline in order to assist with man overboard recovery. The ladder was found to be free of cracks or deformation. One of the stainless steel fasteners on the lower port mount was distorted. One of the fasteners on the lower starboard mount was missing. It is RECOMMENDED (type A1 recommendation) that these two fasteners are replaced with A4-grade stainless steel fasteners. It is likely that the missing fastener had corroded and subsequently sheared off. The other fasteners on the lower mounts of the ladder should therefore be withdrawn and inspected. They should be replaced if they are found to be corroded.

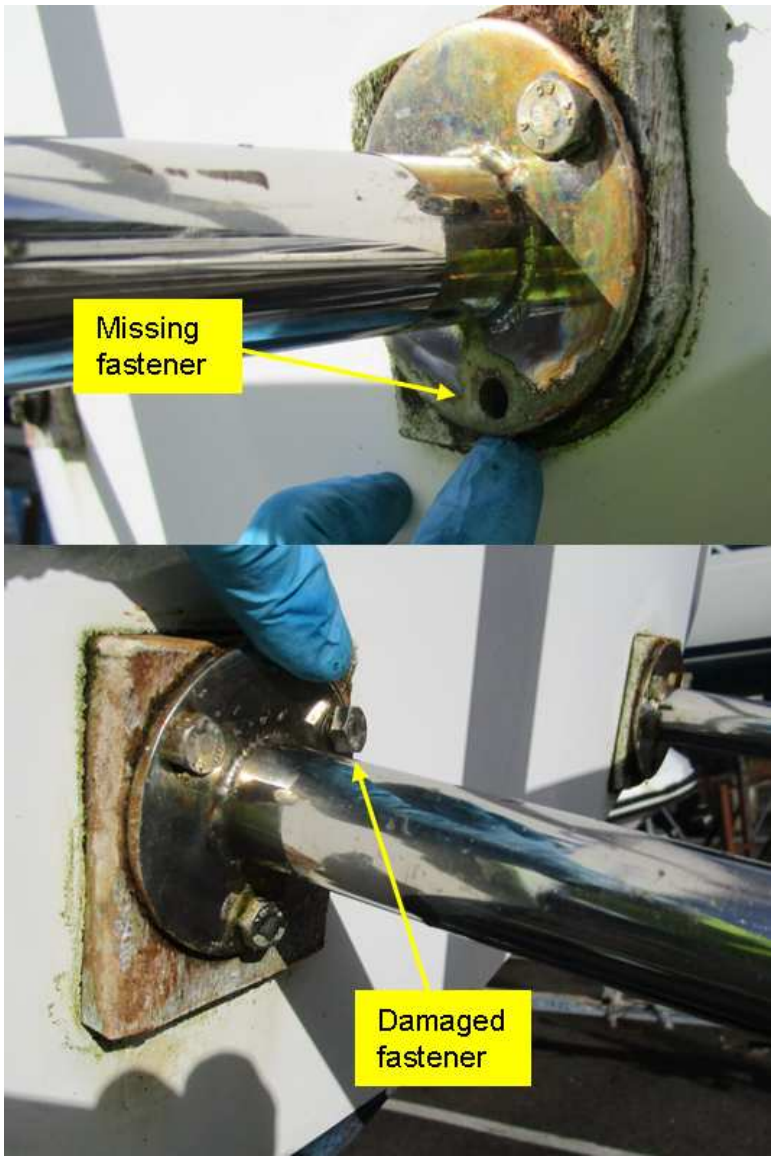

Figure 5: Stern-mounted boarding ladder

5.4 RIGGING AND SAILS

5.4.1 Mast & Boom

5.4.1.1 The Proctor mast could not be ascended with safety, so the rig was examined as far as possible from the deck.

5.4.1.2 The lower part of the mast was in sound condition, with no sign of serious corrosion or physical damage. The gold-coloured anodised protective coating was in acceptable condition but faded in areas. It was noted that some of the fasteners that secure the mast extrusion into the cast aluminium mast foot were missing.

5.4.1.3 The gold-coloured anodised Proctor boom was in serviceable condition.

5.4.1.4 The cast aluminium gooseneck was in acceptable condition, with minor wear on the pivot surfaces. The rivets that secure the gooseneck to the mast and to the boom were in acceptable condition.

5.4.1.5 Four white-coloured aluminium brackets were secured to the mast, positioned on the forward face and just above the steaming light. These had once been used to support a radar antenna.

5.4.1.6 It is advisable to take the mast down for a full inspection every few years, as part of the routine maintenance programme.

5.4.1.7 The mast deck-plate was inspected and found to be free from cracks or corrosion and was well secured to the deck.

5.4.1.8 A gold-coloured anodised aluminium whisker pole was found on the port side deck. It was in good condition, with minor scratches. The forward-most end connector was found to be in good order and functioned correctly. The aft-most end connector was seized. This mechanism should be cleaned and lightly greased.

5.4.2 Chain Plates

5.4.2.1 The chain plates for the cap shrouds, lower shrouds and baby stay were stainless steel U-bolts passing through the deck and secured with adequately sized stainless steel backing plates and nuts. There was no evidence of water penetration on port or starboard sides or beneath the babystay.

5.4.2.2 The forestay chain plate was formed by the stainless steel bow roller fabrication. It was secured to the deck by six stainless steel fasteners and secured to the hull moulding by two further stainless steel fasteners. The fabrication was inspected closely and it was found to be free of damage or deformation. The fasteners were in good working order.

5.4.2.3 The stainless steel backstay chain plate was secured to the deck & hull moulding by four stainless steel fasteners. The chain plate and fasteners were in good working order.

5.4.3 Jib Furling Mechanism

5.4.3.1 The Furlex 200 S roller furling equipment was tested and found generally in good working order. The drum was examined and no defects were seen in either the mechanism or in the rigging screw attachment.

5.4.4 Standing Rigging

5.4.4.1 Inspection of the vessel's documents showed that MELAN had her rigging wires

replaced in May 2009. To be safe, stainless steel standing rigging should be replaced every ten years on a cruising yacht.

5.4.4.2 The masthead standing rigging was formed from 1x19 stainless steel wire, with swaged terminals secured to the chain plates by toggles and bottle screws.

5.4.4.3 The standing rigging comprised single lower shrouds and cap shrouds passing over single spreaders. There was a single backstay terminating on the transom and a babystay secured to the forward end of the coachroof. There was one forestay and one inner forestay. The inner forestay was formed by the headsail reefing foil. All wires were 7mm diameter, although the diameter of the inner forestay could not be measured as it was contained within the reefing foil extrusion.

5.4.4.4 The swaged terminals were inspected and appeared to be free from any bending or distortion that might occur during their manufacture. As far as could be ascertained, the bottle screws and toggles appeared to be in sound condition, with no signs of bending, splitting, cracking or other failure.

5.4.5 Winches, Jammers, Travellers

5.4.5.1 Two primary winches (Lewmar 40, two speed, non self-tailing) were located on the cockpit coaming. They were found to be adequately secured, in serviceable condition but slightly stiff.

5.4.5.2 Two halyard winches (Lewmar 6, single speed, non self-tailing) were securely mounted to the top of the coachroof, positioned either side of the companionway hatch. Both were in serviceable condition.

5.4.5.3 Two winches were mounted on the mast, between the boom and foot. They were found to be adequately secured and in serviceable condition. The port side winch was a Lewmar 8, single speed, non self-tailing. The starboard side winch was a Gibb, single speed, non self-tailing.

5.4.5.4 Two aluminium jib sheet tracks were secured to the toe rails, one on each side deck. The blocks were in serviceable condition and secured to the tracks by cast aluminium sliders. All were in good working order.

5.4.5.5 The mainsheet traveller was secured to the hull moulding at the aft end of the cockpit. The aluminium extrusion and slider were in serviceable condition.

5.4.6 Sails

5.4.6.1 The slab-reefing Crusader mainsail was stowed on the boom. The mainsail was partially opened up for inspection. The sail cloth and stitching were in good condition, with no evidence of significant wear or stretching. The batten pockets were in good order and free of wear. The reefing eyes and head board were free of damage or deformation.

5.4.6.2 The furling genoa was furled on the forestay at the time of survey. It was partially unfurled and inspected. The yellow sacrificial UV strips were faded but in acceptable condition. The stitching and sail cloth were generally in acceptable condition. The sail required a good clean.

5.4.6.3 There was one jib stowed in a blue sail bag, labelled ‘spare furling genoa’. This sail was partially opened up and inspected. It was not a furling genoa as there were bronze hanks fastened to the luff, suggesting that this was a jib for the outer forestay. The hanks were in serviceable condition but in need of a clean and a light coating of Teflon grease. Where inspected, the sail cloth and stitching appeared to be in acceptable condition, with the clew eye and tack webbing in good working order.

5.4.6.4 There was one spare mainsail stowed in a dark blue sail bag. This sail was partially

opened up and inspected. It was found to be heavily used, with numerous repairs to the stitching and cloth.

5.4.6.5 One cruising chute / genoa was stowed in its bag. The eyes of this sail were lightly corroded but in useable condition. The sail cloth and stitching was in acceptable condition, but was slightly damp. This sail should be cleaned and dried.

5.4.7 Canvas

5.4.7.1 A dark blue coloured canvas spray hood was installed on top of the coachroof. The canvas and stainless steel frame were inspected and found to be in good condition. The stitching and fasteners were intact. The plastic windows were clear and in acceptable condition.

5.4.7.2 The dark blue canvas mainsail cover was in good condition and adequately protected the main sail. The zip functioned correctly and was well stitched on to the canvas.

5.4.7.3 The dark blue canvas cockpit dodgers were in good condition and free of significant wear or damage.

5.5 PROPULSION

5.5.1 Engine & Transmission

5.5.2 MELAN was fitted with a Beta D1005 (marinised Kubota) three cylinder diesel engine, with fresh water cooling, driving through a reduction gearbox. Engine control was via a single lever, giving forward & reverse gears and throttle control, mounted on the starboard side of the steering binnacle.

5.5.3 The serial number of the engine was partially rubbed off the engine's label and could not be read.

5.5.3.1 The engine's instruments did not include an engine hour meter; therefore the engine's usage could not be determined.

5.5.3.2 There was no evidence of engine overheating. The paint coating was in good condition, with some minor corrosion.

5.5.3.3 The engine oil was inspected and found to be clean, free of moisture and at the correct level.

5.5.4 The Technodrive reduction drive gearbox was a model TMC 40 M, serial number 140634.

5.5.4.1 The gearbox oil was inspected and found to be clean, free of moisture but at its minimum level. The oil should be topped up with an oil of suitable grade.

5.5.4.2 The engine was briefly run, with coolant water being fed to the raw water intake via a water container that was continuously fed by a hose. The engine started readily from cold. Exhaust gases were clear and free of soot.

5.5.4.3 The engine could not be run under load and the cylinders were not compression tested, therefore no assessment could be made of the engine's compression condition. The engine was not run long enough to assess the efficiency of the engine cooling system.

5.5.4.4 Externally, the engine was clean and in good condition, with no evidence of oil leaks.

5.5.4.5 No leaks from the engine cooling water, fuel and exhaust systems were evident.

5.5.4.6 Ahead and reverse gears could not be tested as the vessel was out of the water.

5.5.4.7 Once the engine had been run for a few minutes, it was turned off. After one minute the engine was started again at tick over speed. The engine immediately reached normal engine speed.

5.5.4.8 The engine oil pressure sounder behaved normally until the engine revs were dropped down from medium speed to tick-over. The oil pressure alarm then sounded continuously. It is RECOMMENDED (type A2 recommendation) that the cause of this is investigated and cured.

5.5.4.9 The alternator belt appeared to be slightly loose. It is RECOMMENDED (type A2 recommendation) that the belt tension is adjusted.

5.5.4.10 The engine bearers were securely mounted, and the flexible rubber engine mounts were in sound condition. The mounting bolts were tight.

5.5.4.11 The engine stop button was mounted on the engine control panel. It operated correctly.

5.5.4.12 Access to the engine's coolant impeller, alternator, raw water strainer, oil filter and oil dipstick were good.

5.5.4.13 Engine exhaust and cooling water were discharged through a plastic Vetus muffler box and an armoured flexible hose, to a hull fitting at the stern, port side.

5.5.4.14 There was evidence that the exhaust hose had been very slightly damaged by chafing from the engine gear control cable, as shown in Figure 6. At the time of survey, the hose was still in contact with the gear cable and further wear is likely. It is RECOMMENDED (type A2 recommendation) that the exhaust hose is re-routed so that it does not chafe on the cable, or adequately protected by a piece of padding material.

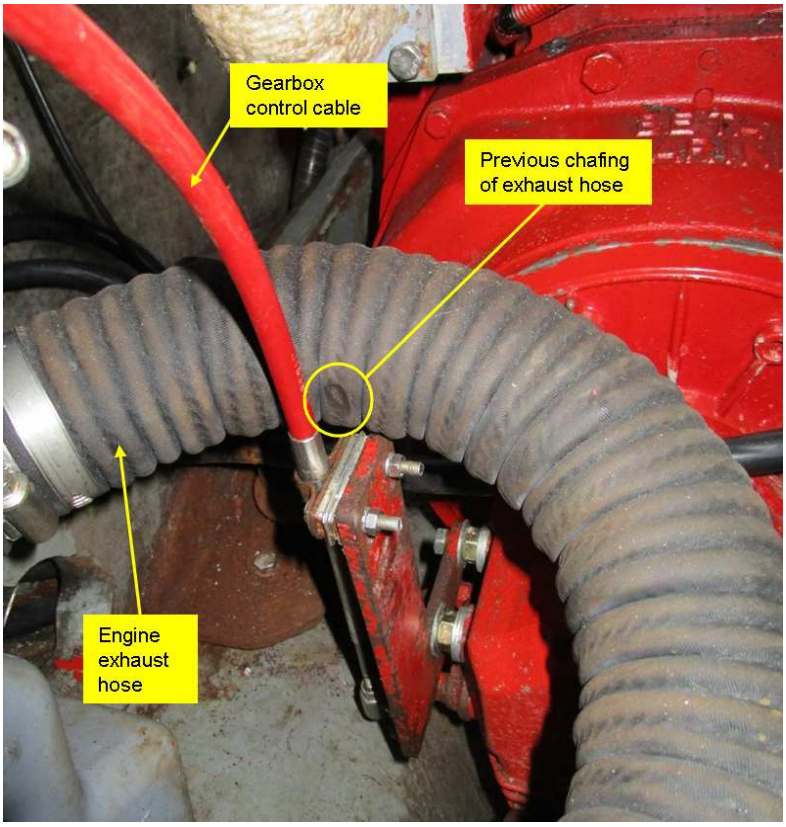

Figure 6: Chafing of exhaust hose

5.5.4.15 The engine should be serviced before use. All fluids and filters should be changed.

5.5.5 Fuel System

5.5.5.1 There was one stainless steel fuel tank mounted beneath the cockpit floor. Access to the fuel tank was from the engine access cover, mounted in the cockpit sole. The visible parts of the fuel tank were clean and free of damage and corrosion.

5.5.5.2 The diesel filling point was located just aft of the cockpit coaming, close to the aft port corner. The filler cap was not suitably labelled. The cap was removed in order to inspect the fibre sealing washer. The washer was in acceptable condition.

5.5.5.3 The hose that connects the filler cap to the tank was in acceptable condition but was kinked where it was connected to the fuel tank.

5.5.5.4 The brass fittings of the return feed, located on top of the fuel tank were loose and were supported by a lump of Blu Tack, as shown in Figure 7. It is RECOMMENDED (type A2 recommendation) that the pipe fittings are tightened and adequately supported.

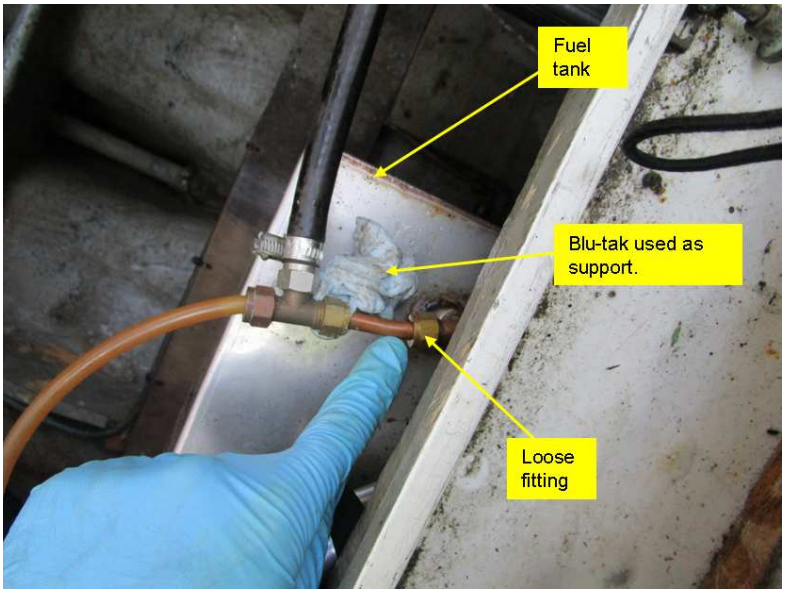

Figure 7: Loose fuel tank pipe fitting

5.5.5.5 The fuel line fittings that secure the fuel hoses to the fuel tank were free of corrosion.

5.5.5.6 The glass-bowl primary fuel filter and cartridge element was in serviceable condition. The connectors that secure the hoses to the filter housing were in serviceable condition.

5.5.5.7 The fuel shut-off valve was located on the starboard side of the fuel tank and was accessed by lifting the engine access cover, mounted in the cockpit sole. The valve functioned correctly.

5.5.6 Stern Gear

5.5.6.1 There was minimum wear between the propeller shaft and cutlass bearing in all directions.

5.5.6.2 The three-bladed, fixed pitch, 14½" diameter bronze propeller was in good condition but was found to be loose on the 1" diameter stainless steel shaft. It is RECOMMENDED (type A1 recommendation) that the propeller is removed from the shaft. The shaft, woodruff key and internal taper of the propeller boss should be inspected for any damage that may have occurred whilst the propeller was loose. If

any wear or fretting has occurred, the parts may need to be repaired or replaced.

5.5.6.3 The propeller was secured to the shaft with a bronze nut & two washers, which were locked by a stainless steel split pin. These were in good condition. There was a long spacer between the propeller boss and the bronze nut. This spacer should have an outer diameter that is at least the same size as the two washers. It could not be determined if the use of this spacer had contributed to the loosening of the propeller on the shaft.

5.5.6.4 The bronze stern bearing and fasteners were inspected and found to be free of corrosion and adequately secured to the hull.

5.5.6.5 A disc-type rope cutter was securely mounted to the stern bearing.

5.5.6.6 The inboard shaft seal was inspected and found to be in poor condition, with cracking of the rubber visible in one area, as shown in Figure 8. It is RECOMMENDED (type A1 recommendation) that the rubber hose of the shaft seal is replaced.

5.5.6.7 The hose clips that secure the seal were in acceptable condition, but the inner two were found to be constructed from A2-grade stainless steel (Figure 8). It is RECOMMENDED (type A1 recommendation) that all of the hose clips are replaced with new A4 grade stainless steel clips when the work described in paragraph 5.5.6.6 is undertaken.

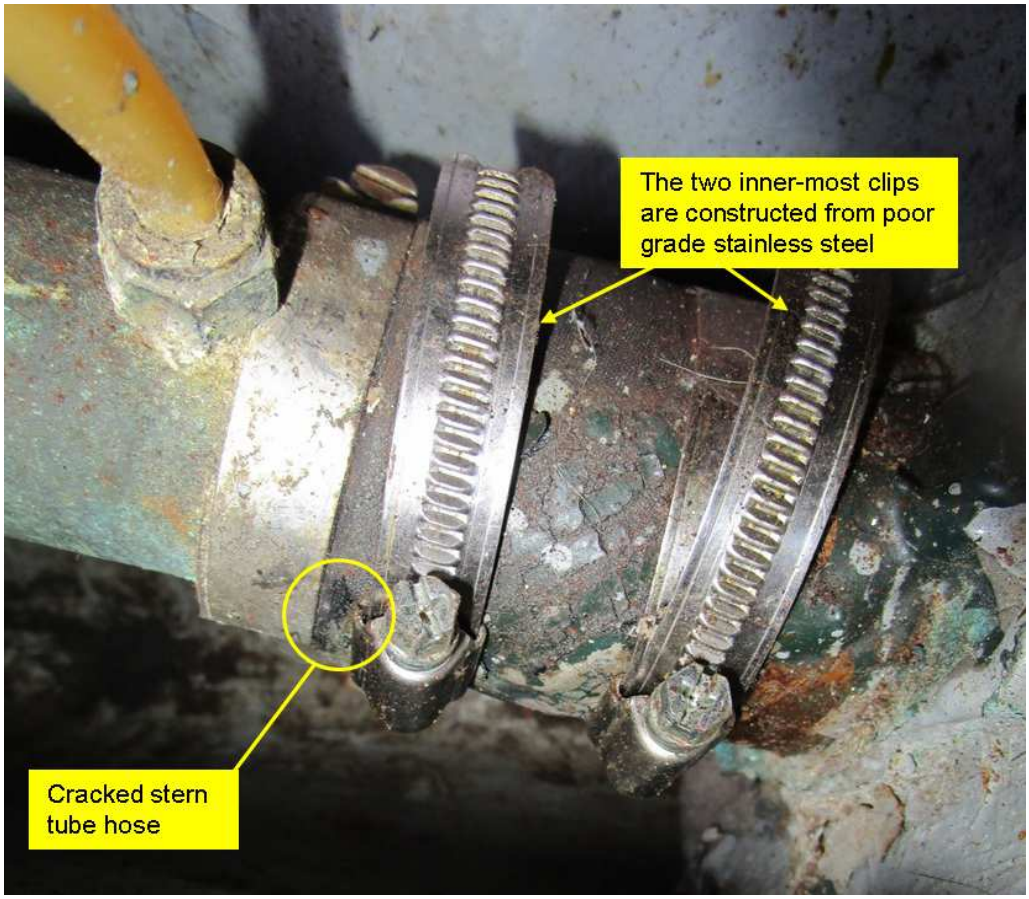

Figure 8: Damage to shaft seal rubber and poor quality clips

5.5.6.8 The grease pump injection point for the stern gland was located in the port cockpit locker. This pump was in serviceable condition.

5.6 SYSTEMS AND SERVICES

5.6.1 Anchor and Chain

5.6.1.1 The 35 lb galvanised steel CQR anchor was inspected and found to be free of wear and with only minor surface corrosion. The anchor was secured to the foredeck, sitting on plastic mountings. The minimum recommended size of anchor for this size of vessel is 29 lbs [Nicolson, Ian. The Boat Data Book. Adlard Coles Nautical, 6th ed.].

5.6.1.2 The chain was attached to the anchor by a stainless steel shackle, which was in good condition but was not seized in order to prevent the bolt from coming loose. It is RECOMMENDED (type A2 recommendation) that seizing wire is used to lock the shackle bolt, or the end of the thread should be peened over to prevent loosening. Stainless steel shackles are particularly prone to coming undone.

5.6.1.3 The anchor chain was made from short plain linked galvanised steel. Dimensions of the chain were 8 mm x 26 mm x 40 mm. The chain was not fully inspected. The length of the chain was not measured. The chain should be laid out and checked for damage or significant corrosion.

5.6.1.4 The recommended length of anchor chain that should be stowed on a small craft is 45 metres, which equates to a length: depth ratio of 5:1 in 9 metres of water [Gerr, Dave. Boat Mechanical Systems Handbook. Adlard Coles Nautical, 2009].

5.6.1.5 The recommended diameter of anchor chain for this size of vessel is 8 mm [Nicolson, Ian. The Boat Data Book. Adlard Coles Nautical, 6th ed.].

5.6.1.6 A spare anchor and length of chain was stowed in the aft cockpit locker. This galvanised steel Danforth anchor was not inspected.

5.6.1.7 A black painted fisherman's anchor was secured to the port side of the pulpit.

5.6.2 Anchor Windlass

5.6.2.1 An electrically operated Simpson Lawrence anchor windlass was mounted on the foredeck. This was inspected and it was found that one of the fasteners (port, aft fastener) that secures the windlass to the deck was missing. This fastener should be replaced. The windlass operation was not tested.

5.6.3 Fresh Water System

5.6.3.1 There were two fresh water storage containers installed on MELAN. The original stainless steel tank was located under the bunk in the fore-peak. The water tank was not accessible for inspection.

5.6.3.2 A second, white canvas water bag was stowed beneath the saloon seating, starboard side. This bag was not plumbed into the water system.

5.6.3.3 Water from the stainless steel tank was fed into a pressurised water system. This water system supplied cold water taps in the galley and in the heads compartment. The pump was located beneath the starboard seating in the saloon.

5.6.3.4 The sinks in the heads and galley were also served by a manually operated foot pump. These worked correctly.

5.6.3.5 There were three filler caps installed on the decks of MELAN: One was located on the starboard side deck. The hose attached to this filler cap was not attached to a water container. There were two filler caps located on the port side deck. The aft-most cap was not connected to any hose. The forward-most filler cap, positioned above the heads compartment, was connected to a hose that supplied water to the water tank

located beneath the forepeak bunk.

5.6.4 Heads

5.6.4.1 The Lavac manually operated sea toilet was clean and the bowl and pump were adequately attached to the Internal Moulding. The installation could not be tested while the vessel was ashore.

5.6.4.2 Next to the toilet was a rectangular stainless steel sink. The sink and taps were in serviceable condition.

5.6.4.3 The toilet inlet and outlet hose was of suitable material and extended upwards behind the toilet to form an anti-siphon loop of adequate size.

5.6.4.4 The lower sides and sole of the heads compartment were formed by the GRP Internal Moulding. The white gel-coat was in good condition.

5.6.4.5 Above the Internal Moulding, the sides of the heads compartment were formed by the bulkhead sides, finished with white melamine. These were in good condition.

5.6.4.6 The ceiling of the heads was finished with light brown carpet.

5.6.4.7 The teak faced plywood door was in good condition.

5.6.5 LPG Installation

5.6.5.1 Inspection of the vessel's documentation showed that MELAN had a Gas Safety certificate that was certified in April 2014.

5.6.5.2 Two LPG (butane) gas cylinders were stored in a plywood storage compartment, located in the port cockpit locker. The hinging & latching door for this compartment was not gas tight.

5.6.5.3 It is strongly suggested that both cylinders are stowed in a gas tight container that is specifically constructed for the storage of LPG cylinders. The container should be fitted with a drain hose. Ensure that the drain hose drains to the skin fitting along a steady gradient, ensuring that the hose does not trap water. The storage container should be securely attached to the inside of the cockpit locker.

5.6.5.4 The cylinder attached to the gas hose was fitted with an on/off tap and pressure regulator. From the pressure regulator, rubber hose led the gas supply to a copper pipe on the side of the gas locker. The pressure regulator was nearly new. These should be replaced every ten years. The rubber hose was manufactured in March 2013. Gas hose should be replaced every five years.

5.6.5.5 A bubble-type testing device was installed inside the cylinder storage compartment. This was nearly new.

5.6.5.6 The copper pipe led the supply through the aft cockpit locker, the starboard cockpit locker and to an isolating valve mounted next to the stove in the galley. A flexible hose then conveyed the gas supply to the cooker. The rubber hose was manufactured in March 2013. Where inspected, the pipe was found to be adequately supported but was not always protected from chafing where it passes through bulkhead openings.

5.6.5.7 The Flavel Vanessa twin hob, oven and grill installation was secured by a gimbal mechanism to the galley structure. The cooker was clean. The burners of the cooker were not tested.

5.6.5.8 The installation was not further inspected or pressure tested for leaks.

5.6.5.9 Note that this survey is not any kind of gas safety certificate. This is only obtainable after comprehensive pressure testing and assessment by a qualified person listed on the gas safety register. See http://www.gassaferegister.co.uk for further details.

5.6.6 Galley

5.6.6.1 The galley was situated on the starboard side of the vessel and forward of the cockpit bulkhead.

5.6.6.2 There was a rectangular stainless steel sink in the galley area. The sink was supplied with cold water.

5.6.6.3 There was one top-access cool box located under the seating in the saloon, port side. This was clean and in acceptable condition but was not secured to the seating frame.

5.6.6.4 There were a range of sliding doors for crockery and food stowage. The surfaces of the melamine worktop were in fair condition. The wooden doors and framework were all in acceptable condition.

5.6.7 Electrical System

5.6.7.1 MELAN had a 12 volt d.c. electrical system, with an engine starting battery and a single battery for services. The batteries (both deep cycling) were located beneath the port saloon seating in adequately ventilated areas. They were both securely tied down to prevent movement in the event of a capsize. The condition of the batteries was not tested.

5.6.7.2 Battery charging was from the engine alternator.

5.6.7.3 A single rotary breaker switch controlled the output from the batteries. Service power was then distributed via two switch panels, each consisting of six switches. All switches were fitted with a circuit breaker. The switches were poorly labelled with non-waterproof labels.

5.6.7.4 The 12 volt d.c. wiring that could be seen appeared to be serviceable and was adequately supported along its length.

5.6.8 Navigation Lights

5.6.8.1 A transom mounted stern light was adequately attached to the pushpit on the stern. This was tested and found to function correctly. The lens was inspected and found to be free of cracks or crazing.

5.6.8.2 A bicolour light was mounted on the pulpit. This was tested and found to function correctly. The lens was inspected and found to be free of cracks or crazing.

5.6.8.3 A mast-top tricolour was installed. This was tested and found to function correctly

5.6.8.4 There was no anchor light installed.

5.6.8.5 A steaming light and deck light unit was mounted half-way up the mast. The lamps did not function. It is RECOMMENDED (type A2 recommendation) that the steaming light is fixed.

5.6.9 Navigation Equipment

5.6.9.1 MELAN was equipped with a ‘Solent’ compass, mounted on the helm binnacle. The illumination lamp for this compass did not function.

5.6.9.2 One Furuno GP-30 GPS unit was installed in the saloon. This unit powered up when switched on and subsequently gave latitude & longitude reading. Serial number was 3423-0618. The GPS antenna was mounted on top of a stainless steel pole, secured to the starboard side of the pushpit. Antenna type was GPA-017, serial number 070697.

5.6.9.3 A NASA SX 35 VHF / DSC radio was installed in the saloon. Serial number was 230680. This unit powered up and received signals, but was not tested for transmission.

5.6.9.4 A Dataline X depth sounder display screen was mounted in the cockpit, positioned on the port bulkhead. This unit gave a depth reading, but its accuracy could not be determined whilst out of the water.

5.6.9.5 A Dataline X wind speed and direction was mounted in the cockpit, positioned on the starboard bulkhead. The sensors were mounted to the top of the mast. This unit powered up but gave no speed or direction information. This unit & sensors should be repaired.

5.6.9.6 A clock & barometer were mounted on the main bulkhead in the saloon.

5.6.10 Security

5.6.10.1 The cockpit hatch was located on the centreline of the cockpit. The moulded GRP sliding hatch and two-piece doors were inspected and found to be sturdily built and in satisfactory condition. A substantially constructed stainless steel security mechanism was fitted to the GRP sliding hatch. This fabrication was not working correctly. It is RECOMMENDED (type C recommendation with an implementation time of one month) that the locking mechanism is fixed.

6 SAFETY EQUIPMENT

Refer to the Boat Safety Handbook [RYA publication, 2012, ISBN 978-1-906435-53-0]. This book gives recommendations and advice concerning the selection and installation of safety equipment.

6.1 BAILING / BILGE PUMPING

6.1.1 A manual diaphragm bilge pump was located in the top of the cockpit seating, port side. The pump handle was not fixed to the pump. The inlet end of the hose was secured in place in the bilges, adjacent to the stern bearing. The inlet of the hose should be fitted with a strum box:

http://marinestore.co.uk/Side_Entry_Strum_Box___Strainer.html

6.1.2 The pump was not tested as this would have required a large volume of water to be placed in the bilge.

6.1.3 It is RECOMMENDED (type A2 recommendation) that the pump handle is tethered by a length of line in order to prevent its loss.

6.1.4 It is RECOMMENDED (type A2 recommendation) that the pump is tested, with the inlet end of the hose temporarily placed in a bucket of water.

6.1.5 It is RECOMMENDED (type A2 recommendation) that two buckets (with lanyards) are stowed on board. These should be between 9 and 14 litres in capacity.

6.1.6 Consideration should be given to installing a second manual bilge pump or an electric bilge pump.

6.2 DETECTION EQUIPMENT

6.2.1 A Firdell Blipper, passive type radar reflector was secured to the mast.

6.2.2 One hand-held compressed gas fog horn was found on the vessel. This functioned correctly. A spare cylinder should be carried on board.

6.2.3 There was one motoring cone and one anchor ball found, stowed in the starboard cockpit locker.

6.3 FIRE FIGHTING EQUIPMENT

6.3.1 Two fire extinguishers were found on board. These are summarised in Table 4.

Type	Location	Date Stamp	Pressure Gauge
0.6 kg ABC dry powder	Forepeak	None found	Green
1 kg ABC dry powder	Companionway steps, starboard side	None found	Green

Table 4: Fire Extinguishers on board MELAN

6.3.2 Most fire extinguishers have a five year service life. Ensure that the extinguishers are serviced or replaced after this five year period. Regularly shake dry powder extinguishers to prevent the powder coagulating.

6.3.3 A fire blanket was stowed on board. It is RECOMMENDED (type A2 recommendation) that the blanket is securely attached in a suitable location and is installed within two arm lengths of the cooker.

6.4 CARBON MONOXIDE ALARM

6.4.1 There was no Carbon Monoxide alarm installed on MELAN. It is RECOMMENDED (type A2 recommendation) that one is procured and mounted in an appropriate location.

6.5 FIRST AID KIT

6.5.1 There was one first aid kit found on the vessel. The contents should be checked and any items that have expired or are missing should be replaced.

6.6 GAS ALARM

6.6.1 There was no gas alarm installed on MELAN. It is strongly suggested that one is installed.

6.7 STRONG POINTS

6.7.1 One lifeline strong point was secured to the cockpit sole, just aft of the companionway hatch and forward of the helm. The loop was free from deformation and was well secured to the hull moulding. It was accessible from the cockpit entrance.

6.7.2 The vessel was fitted with wire jackstays. The wire and deck fittings were found to be secure and in good order.

6.8 MAN OVERBOARD RECOVERY EQUIPMENT

6.8.1 One yellow horse shoe life rings was stowed in its wire frame on the pushpit, starboard side. The ring was in good condition. The vessel's name should be applied to both sides of the buoys in large black lettering.

6.8.2 One flotation light (no batteries) was secured to the life ring. It is RECOMMENDED (type A2 recommendation) that batteries are fitted to the light. The lamp should then be tested.

6.8.3 One dan buoy was stowed in its frame on the pushpit, starboard side. It was in good condition. This buoy should be tethered to the horse shoe life ring by a length of flotation line.

6.8.4 One recovery sling and flotation line was stowed in its blue canvas bag and was secured to the pushpit, port side. The sling was not fully examined, but appeared to be in serviceable condition. The sling and line should be fully removed from its bag and the sling & line inspected for damage or degradation.

Eur Ing Nic Fieldhouse BEng (Hons) CEng MIMechE AssocIIMS

Marine Surveyor, Fieldhouse Yacht Surveys.

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Appendix 1. Types of Recommendations Used in This Report

The recommendations detailed within the body of this report are presented in five categories and are classified as follows:

Type A1 Structural, mechanical or other defects requiring IMMEDIATE attention i.e. those affecting structural strength, seaworthiness or safety which MUST be repaired BEFORE the vessel is relaunched at this time.

Type A2 Structural, mechanical or other defects affecting strength, seaworthiness or safety which may be repaired after the vessel is relaunched but MUST be repaired before the vessel is taken to sea.

Type B Defects not affecting strength, seaworthiness or safety but which, by their nature, should be dealt with before putting the vessel afloat.

Type C Structural, mechanical or other defects NOT requiring immediate attention but are to be dealt with within a specified time period.

Type D Non-essential or cosmetic defects whose repair may be left to the Owner's convenience. All suggestions are, unless noted otherwise, of this type.

These recommendations are intended to be only a guide to necessary rectification work. Both type A and type B recommendations cover urgent remedial work to be carried out as soon as practical. Type C recommendations cover significant remedial works to be carried out within the specified time period. It should also be noted that, in some instances, defects are noted within this report without a covering recommendation. In such cases either no action is necessary or the remedy is self-evident.

Appendix 2. Abbreviations Used in This Report

BHP	Brake Horse Power
CIN	Craft Identification Number
CQR	A design of anchor
dc	Direct Current
DSC	Digital Selective Calling
GPS	Global Positioning System
GRP	Glass Reinforced Plastic
IIMS	International Institute of Marine Surveyors
LPG	Liquid Petroleum Gas
SSR	Small Ships Register
UV	Ultra Violet
VHF	Very High Frequency