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Survey Report no:

Name of Vessel: "[redacted]

Type of Vessel: Maxum 2400 SCR, FRP (Fibre reinforced plastic), motor boat

Type of survey: Pre-purchase

At the request of:

[redacted]

This survey was carried out on the [redacted] at Premier Marina, Sovereign Harbour, Eastbourne, UK. The above named being a prospective purchaser of the vessel.

Limitations:

- Where access is restricted by fixed panels, linings etc. it was not possible to examine and I cannot say those areas are free from defects.
- This report has been prepared for the use of the commissioning client and no liability is extended to others who may see it.
- In some cases it is not possible to detect latent and hidden defects without destructive testing which is not possible without the Owner's consent.

Scope of Survey:

- This is a Pre-Purchase Survey and its purpose is to establish the structural and general condition of the vessel. Where items of equipment have been tested this will be stated in the text.
- Camera equipment was used in places to view normally inaccessible areas and the pictures analysed to identify any issues.
- A general inspection of the engine and installation will be made; this is a visual inspection and running the engine up but not underload. It should be appreciated that some components may appear serviceable but found to be defective when the engine is run for a long period of time.
- The hatches and port lights were not leak tested with a hose.

Recommendations and advisory notes:

- Recommendations will be restricted to those defects which should be rectified before vessel is used, (or within a given time span if specified), and items which may affect insurability. These will not be made concerning cosmetic or other minor defects, although relevant suggestions may be made in the text.
- ***Recommendations will be printed in bold italics for quick reference.***
- The recommendations are contained in the body of report in order that they may be read in context, and are also listed as part of the conclusions at the end of this Report.
- **Advisory notes** are suggestions to prevent a problem getting worse or general advice and do not have to be carried out before the vessel is used nor should affect the boats current insurability.

Conditions of Survey:

Vessel was examined first in the water and then in the slings of a travel hoist at Premier Marina, Sovereign Harbour, Eastbourne. The engine was run on the dock and the purchaser and owner drove the vessel to the travel hoist and then again after the survey. The weather was fine.

No special conditions affected the survey other than as described in the text.

Information is reported in the Sections below, followed by recommendations and conclusions.

Hull, Deck and Structure.

1. Details of Subject Vessel, (General Description, Dimensions, Registration etc.).
2. Hull below Waterline including keel
3. Topsides above Waterline
4. Deck Moulding.
5. Coach roof and wheel house mouldings
6. Cockpit.
7. Hull/Deck Join including Rubbing Strake
8. Bulkheads and Structural Stiffening including Internal Mouldings.

Steering, Stern Gear, and Skin Fittings etc.

9. Rudder and Steering.
10. Stern Gear.
11. Cathodic Protection.
12. Skin Fittings and other through Hull Apertures.

On Deck.

13. Main Companionway and other Accesses to Accommodation.
14. Ports Windows etc.
15. Pulpit, Stanchions, Pushpit, Lifelines and Jackstays.
16. Ground Tackle and Mooring Arrangements.
17. Other Deck Gear and Fittings.
18. Davits and Boarding Ladders.

Safety.

19. Navigation Lights.
20. Bilge Pumping Arrangements.
21. Fire fighting Equipment.
22. Lifesaving and Emergency Equipment.

Engine.

23. Engine and Installation.
24. Fuel System.

Accommodation and onboard Systems.

25. Accommodation General.
26. Gas Installation.
27. Fresh Water Tanks and Delivery.
28. Heads.
29. Electrical Installation.
30. Electronic and Navigation Equipment.
31. Heating & Refrigeration

1. Details of subject vessel:

Maxum boats are part of the Brunswick Group of companies which includes Bayliner and are USA based. The boats are built in the USA by Maxum Marine, Everett, WA. The 2400 SCR is a sport cruiser with a deep V planning hull.

Manufacturers' information from websites (not verified by measurement)

Length Overall	25'4"
Length of waterline	
Beam:	8'6"
Draft:	2'11"
Displacement	5000lbs
CE Specification	Built 1 year before required. US coast guard max 12 persons

Boat specific information – info from boat

Registration	British Small ships [redacted]
HIN Number	BL2A[redacted]L697
Year of Build	December 1996 – 1997 model

2. Hull below Waterline including keel:

a) Construction of the hull below the waterline is solid FRP, built with hard chines (sharp edge of hull) and 3 spray rails. Receipts were seen for two coats antifouling July 2010 and this is applied over at least 4 old coats of antifouling. The owner advised that the boat has been in the water since July 2010.

b) No signs of major damage or repair were noted to the hull and no signs of distortion.

c) Light hammer sounding was carried out (not heavy enough to damage the anti-fouling) of the hull at regular intervals approximately 500mm spacing all over.

d) The antifouling was removed in about 50 patches approximately 50mm x 50mm at random around the hull below the water line including the spray rails and chines. While scraping I was looking for evidence of wicking or blistering and stress cracking at the rails. Once removed all patches were checked with 10x magnification.

e) Moisture readings were taken where the antifouling was removed using a capacitance type moisture meter of Sovereign Quantum type, operating in both shallow and deep reading modes. The meter was first checked for correct calibration.
The readings recorded below are from the meter operating in the shallow and also deep mode on the relative scale 0-100.

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

The conditions prevailing when the readings were taken were as follows:

Air Temperature:	**18.5°C**
Relative Humidity:	**36.5%**
Time ashore	**30 minutes**
In summary the weather conditions for obtaining moisture readings were	

Readings were as follows:

Meter	**Range below waterline.**	**Range above waterline.**
Sovereign Quantum, Scale A, 0-100 Shallow mode	**33 – 67**	**15**
Deep Mode	**36 – 72**	**13**

These readings need to be considered in conjunction with the period the vessel has been ashore and the weather conditions when obtained. As a rule of thumb you can expect the levels to drop by one range after a few weeks ashore.

The difference between readings above the water line (normally dry) and below should be noted.

The interpretation of the readings in shallow mode range;

- 0 – 15 : For all practical purposes may be considered dry.
- 16 - 20: Some moisture present at low levels but of no great concern.
- 21 - 30: Considered medium, but those at the top of the range i.e 30 are at the point where the risk of moisture related defects developing is significant.
- 31- 45 Considered high and at a level where the risk of moisture related defects being present but not yet physically detectable is significant.
- 46 – 60 Very High and will usually be accompanied by physically detectable signs. Likely to be accompanied by a significant increase when switching to deep mode.

- 61 – 100 extremely high and indicative of possible laminate damage in addition to osmotic blistering. Likely to be accompanied by a significant increase when switching to deep mode.

Advisory note:- As I advised at the time, no physical defects or signs of delamination are showing and the boat has been in the water a while. The readings are higher than I would have expected and will have an effect on resale. Always storing the boat ashore out of season to allow some natural drying out to occur will contribute significantly to maintaining condition.

3. Topsides above Waterline

a) Constructed of solid FRP and finished in white gel. A bowsprite is constructed into the moulding.
b) Top side moulding is not distorted. There is some minor gel coat voids which have broken open exposing dry laminates behind on the port aft quarter.
c) The topsides were lightly hammer sounded and no indication of voids found. Moisture readings were taken and recorded as above.

Advisory note: The voids should be cut out and filled with epoxy filler or gel filler to prevent water ingress into the laminates.

4. Deck moulding:

a) The deck is of solid FRP finished in white with non slip pattern moulded in.
b) The whole deck was carefully tested underfoot for signs of delaminating or other structural defects.
c) No significant faults were found.

5. Coachroof and wheel house mouldings:

a) Constructed as part of the deck moulding and finished in the same way.
d) The whole area was carefully tested underfoot for signs of delaminating or other structural defects.
e) No significant faults were found.

6.Cockpit:

a) Constructed as part of the deck moulding, and housing the seating area.
b) Drainage is via the stern door, through two drains in the starboard aft in the gulley around the engine hatch, in the port aft quarter and by the companionway door. All drain through the top sides through plastic skin fittings, secured with hose clips. All found secure when tested.
c) The cockpit sole has a hatch cover hinged aft to access the engine compartment. A deep gulley around it stops water going onto the engine.

d) No significant faults found.

7. Hull/Deck Join including Rubbing Strake: :

a) This is a mechanical joint. The deck moulding sits over the hull moulding and is fixed with bonding paste and stainless screws through the aluminium rubbing strake. The rubbing strake has a rubber insert in it. The joint was visible in the anchor locker and in the engine compartment.
b) There is no significant damage to the rubbing strake viewed externally. The rubber is coming away around the bow sprite slightly.
c) There are no indications of leaks at the joint internally where viewed.

8. Bulkheads and Structural Stiffening including Internal Mouldings:

This is a Monocoque (single box) construction and a number of components contribute to the overall structure.

a) The hull and deck mouldings are robust in the first place. FRP stringers and floors are bonded to the hull moulding. The bulkhead is part of the deck moulding and bonded in place.
b) All possible access was checked, lockers, under berths and the floors and inner mouldings for signs of delamination and cracks and none were found.

9. Rudder and Steering:

a) The steering is via the stern drive which is reported below.
b) The wheel is connected to the stern drive via a Morse cable which enters a rack which is power assisted hydraulically from a pump on the engine. The rack is well secured, no signs of corrosion or damage.
c) The fluid level is correct in the reservoir.
d) Steering was operated full lock to lock with and without power assist and operate fine.
e) Pair of hydraulically operated trim tabs are fitted to the transom. These are stainless steel. The fixing screws are slightly corroded. When first operated in the water they did not function. Once cleaned off they fully functioned up and down. The indicator on the dashboard did not function.

Advisory note: The purchaser should be aware the boat level indicator did not function. This could be an electrical fault.

10. Stern Gear:

a) The stern drive is a Mercruiser Alpha One unit number OK1220[redacted]. The Propeller is a 4 blade alloy secured with lock nut and locking washer. This was secure in place.
b) The sterndrive has been coated with outdrive antifouling paint but was badly fouled when hauled and some small barnacles remain. The stern drive trim was operate up and down and the trailer function operated to lift the leg fully. At each position and on full lock to lock the bellows were visually checked and the clips struck with a screwdriver and

hammer and all found secure, no signs of corrosion or splits on the bellows noted. All hoses were intact and connected where seen.

c) The internal fixings were checked and no faults noted.
d) Receipts were seen where the stern drive had been checked in September 2009 last.

Advisory Note: It is strongly advised that the outdrive units be inspected and tested by a qualified Mercruiser engineer as repairs and even routine servicing are very expensive with these units.

11. Cathodic Protection:

a) There are anodes for the sterndrive only. These are mounted above the propeller, on the rams and under the base of the securing bracket.
b) All anodes are very wasted.
c) The trim tabs do not have anodes fitted.

Recommendation: All 4 anodes should be replaced as soon as possible to prevent Cathodic damage occurring to the sterndrive.

Advisory note: Consideration should be given to fitting anodes to the trim tabs as the fixings are starting to corrode.

12. Skin Fittings and other through Hull Apertures:

Some thru hulls may not be reported below but will be with relevant systems sections.
No skin fittings or valves were dismantled as part of this survey but the following routine tests were carried out:

- Examination from outside and inside the boat. Checked for de-zincification
- All valves open and closed to their full extent where possible.
- Any fixing bolts hammer tested where accessible.
- Bodies of metal valves or sea cocks tested with a hammer inside the boat and external parts hammer tested outside the boat.
- Fittings aggressively tested inside the boat for security in the hull.
- Hose clips inspected and hoses aggressively tested for security. 2 clips correctly fitted below water line on outlet spigot unless noted.
- Lying fair to hull unless noted

Below Waterline:

a) Toilet seawater inlet – mounted in the engine compartment – Bronze skin fitting with strainer fitted, bronze ball valve.
b) Engine sea water intake is through the leg.

Above waterline

c) Aft bilge pump – white plastic skin fitting – starboard aft quarter top side
d) Toilet waste macerator outlet – white plastic skin fitting – starboard aft quarter top side
e) 2 x Cockpit drains – white plastic skin fitting – starboard aft quarter top side
f) Shower pump out – white plastic skin fitting – starboard amidships top side
g) Forward bilge pump – white plastic skin fitting – starboard amidships top side
h) Heads sink drain– white plastic skin fitting – starboard amidships top side
i) Cockpit drain – white plastic skin fitting – port aft quarter top side
j) Cockpit drain – white plastic skin fitting – port amidships top side
k) Galley drain – white plastic skin fitting – port amidships top side
l) Holding tank breather– Chrome bronze skin fitting – starboard amidships top side
m) Diesel tank breather– Chrome bronze skin fitting – starboard amidships top side
n) Water tank breather– Chrome bronze skin fitting – Port aft quarter top side

13. Main Companionway and other Access to Accommodation:

These were all checked;

- to be lying fair to the deck
- fixings were randomly tested with screw driver for tightness
- frames checked for damage
- a secure method of closure
- correctly fitted hinges
- glazing checked for damage
- gaskets checked

All found ok unless noted. The hatches were not hose tested for leaks.

a) Companion way is Perspex hinged to side with sliding cover hatch.
b) Cuddy cabin hatch is 500mm^2, hinges aft with two catches to keep closed.

Advisory note: Companionway door has no means to stay shut without hatch cover closed. Forward hatch should remain closed at when at sea.

14. Ports, Windows etc.:

The same checks as section 14. above were carried out. All found ok unless noted. The ports and windows were not hose tested for leaks.

a) 3 opening portlights below the weather deck, each in a plastic frame through bolted the hull with stainless steel bolts and nuts. Each has 3 screw catches and hinges above.
b) Window to cockpit from cabin, sliding Perspex in alloy frame. There is some staining around this window in the carpet covering suggesting this window does leak.

15. Pulpit, Stanchions, Pushpit, Lifelines and Jackstays:

These are tested under full body weight where practical, terminal ends checked, type of wire tested.

a) Push pit and deck rails are stainless steel tube through bolted the deck. Some fixings were visible in the anchor locker and these were shiny with no corrosion.
b) No significant faults found.

16. Ground Tackle and Mooring Arrangements:

a) One anchor found aboard Danforth type, no weight marked. Suggest 6KG with length of 6mm chain and warp attached. The chain feeds down a hawse pipe into the anchor locker below. The anchor is laid over the bow roller in the bow sprite.
b) There are no significant signs of corrosion on the mooring equipment.
c) The anchor and chain are suitable for inshore use.
d) There are mooring cleats around the vessel securely attached.

17. Other Deck Gear and Fittings:

a) Wiper worked correctly
b) Bimini cover slightly mildew stained. Cockpit covers no signs damage noted.

18. Davits and Boarding Ladders:

a) Vessel has permanently attached stainless steel boarding ladder which extends below the waterline and is securely attached.

19. Navigation Lights:

Vessel fitted with lights of correct size, securely mounted and seen working unless noted.

a) Bi colour at bow
b) Single white all around light on pole – not working.
c) Compass light – not seen working

Recommendation: Vessel must display correct light signals – white a stern and forward as well as Bicolour when motoring at night or in poor viability. All around white when at anchor at night.

20. Bilge Pumping Arrangements:

a) Automatic and manual operation electric submersible bilge pump, 500GPH in engine compartment. Operated manually, no water to test automatic operation as sealed unit. Light on dash when operating.
b) Automatic and manual operation bilge pump with float switch in saloon bilge. Did not operate in either mode. Light comes on on dash board so suspect pump faulty.

Advisory note: Ensure bucket with lanyard (rope attached) is carried as back up bilge bailer and suggest fix second bilge pump.

21. Fire-fighting Equipment:

a) Automatic 1.3Kg Halon Gas in engine compartment. Dated 2001. Haylon gas is banned in the EU.
b) 1KG Powder 5A 34B rating in galley. No date.

Recommendation:- Replace engine fire extinguisher.

Advisory note: There are no laws governing fire extinguishers on pleasure boats at sea. Suggest Service or replace 1 KG portable 5A 34B spec mounted in the cabin and also fit a plugged hole in top of engine cover so this extinguisher can be used as back up to engine fire protection without lifting the cover.

22. Lifesaving and Emergency Equipment:

The following was noted aboard

a) Life ring
b) Personal life jackets

Advisory notes

- The RNLI operate an excellent free inspection and advice service concerning levels of safety equipment (SEA Check) and can be contacted on 08003280600 or via the RNLI website, www.rnli.org.uk.
- The RYA also publishes a booklet, G16, "The Boat Safety Handbook" and this specifies levels of Safety Equipment for different categories of use. Booklet is obtainable from nautical bookshops or direct from the RYA, www.rya.org.uk.

Recommendation - this vessel be equipped with safety equipment to the level appropriate to proposed use.

23. Engine and Installation:

a) Engine is an inboard petrol engine, Type Mercruiser 4.3LX Gen+ with carburettor.
b) Serial number 1A 340631
c) Invoices seen that engine was replaced new in 26th May 2009.
d) Engine is very clean with no visible oil or water leaks.
e) Engine is rubber mounted onto FRP engine beds. The coach bolts used to fix the mounts are in at an angle but firm.
f) Engine bay has electric blowers that operate.
g) Exhaust is through stern drive as is water intake.
h) Engine was started from cold and started immediately. Once warm, it was shut and started again a few times at intervals.

i) Oil pressure was 40 – 50PSI and temperature was 80°C.
j) Purchaser advised engine over heated on way from berth to hoist. When hauled intakes were fouled. These were cleaned. Purchaser will test again before buying.

24. Fuel System:

a) Fuel is petrol. Filler is on transom quarter. Breather described above. Tank is alloy mounded in front of engine but lower. The fuel hoses are all ISO 7840 Marine grade USCG equivalent and securely clipped.
b) There is no fuel shut off tap.
c) There were no signs visible or smell of fuel leaks.

Advisory note: Consider fitting fuel shut off at tank with remote operation outside of engine compartment.

25. Accommodation General:

a) Clean and tidy, no smells of damp.

26. Gas Installation:

There is no gas system

27. Fresh Water Tanks and Delivery.

a) Plastic water tank in engine compartment with pressure pump. Cold water only. No sogns of leaks.

28. Heads:

a) Toilet is Jabsco manual, connected to holding tank. This can be emptied from shore or overboard with macerator pump. Hoses all secure. Tank secure. No smells.
b) Toilet pump is stiff and squeaks.

Advisory note: Service toilet pump and lubricate valves in pump.

29. Electrical Installation:

DC circuits

a) A single battery system, 12V 110AH charged from the engine and shore power. Battery is secure in box and strapped down. Terminals tight. Isolator switch mounted near battery.
b) All circuits go through fuse panel below helm and all switch from dash board.
c) Spare battery secured in cabin.

240v Circuits

a) Shore power to main panel with main RCB and separate RCD's for Microwave, cooker, battery charger, sockets. Professionally fitted from new.
b) Owner advised cooker does not work.

Advisory Note: Tidy up some of the wires around the battery. Cooker has alcohol option to work.

30. Electronic and Navigation Equipment:

The following was seen aboard operating

a) Garmin GM520S with chart chip
b) Clipper depth guage
c) Danforth Binnacle compass
d) Swiftec VHF Not DSC type.

31. Heating and refrigeration

a) No heating.
b) Fridge removed and replaced with electric cool box.

RECOMMENDATIONS and CONCLUSIONS:

List of Recommendations:

The Recommendations made in the Report are listed below with their respective section numbers. ***All Recommendations should be carried out before use of vessel or as stated.***

11. Cathodic Protection:

Recommendation: All 4 anodes should be replaced as soon as possible to prevent Cathodic damage occurring to the sterndrive.

19. Navigation Lights:

Recommendation: Vessel must display correct light signals – white a stern and forward as well as Bicolour when motoring at night or in poor viability. All around white when at anchor at night.

21. Fire-fighting Equipment:

Recommendation:- Replace engine fire extinguisher.

22. Lifesaving and Emergency Equipment:

Recommendation - this vessel be equipped with safety equipment to the level appropriate to proposed use.

Conclusions:

Excluding the hull moisture readings the boat is in very good condition for her age especially with the replaced engine. There are some minor faults to be attended to but she is not showing signs of aging. The hull is not a structural fault and could improve if the advice is carried out.