

Motorboat Owner

Affordable practical boating

PRACTICAL GUIDE

Used Boat Self-Survey



FOUR-PART SERIES

- *Part 1 Hull and exterior*
- *Part 2 Interior and electrics*
- *Part 3 Machinery*
- *Part 4 Sea trial*

Used Boat Self-Survey **PART 1**



FOUR-PART SERIES

- *Part 1 Hull and exterior*
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For most of us, a used boat purchase represents the second largest purchase we are likely to make. Even a modest boat is a serious outlay when you are on a modest income. It would be prudent, therefore, to take great care over the purchase and allow your head to overrule your heart when it comes to decision making. We would always recommend getting a professional survey carried out on any potential purchase that represents a significant outlay. Where you draw the

line will depend upon how risk averse you are, but once the boat's purchase price reaches a few thousand, it pays to spend a few hundred having it looked over by someone who knows what to look for.

Having said that, when you are in the market, those survey fees could start to pile up if you get one carried out on every boat that takes your fancy, especially when some of these boats will have enough issues that you subsequently decide to walk away. In this case the survey fee

is well worth paying, as it will save you from an expensive mistake, but many of the faults can be found during your initial inspection, allowing you to decide whether to spend your survey money on an altogether more worthwhile prospect. Equally, if you are buying a boat that falls outside of your risk assessment for a professional survey, you should at least ensure you give the boat a serious going over yourself before committing.

In this article we show you how to carry out a DIY pre-survey survey. That's a survey that you can undertake yourself, before deciding if the boat purchase is worth proceeding with and ultimately investing in a professional survey. In the case of bargain basement boats that probably don't justify the cost of a professional survey, this is your best chance to decide if the boat is a project or a basket case.



With the boat out of the water, the DIY surveyor can access all the important areas

Over the next three issues we are going to take you through what the untrained eye should look for in a used boat, starting this month with the hull and exterior fixtures and fittings. It is fair to say that there is unlikely to be a boat on the second hand market that doesn't fall foul of a few of the things we are pointing out. Very little is irreparable, so rather than see them as an excuse to walk away, use them as a bargaining tool to find the right price for the boat.

Below the waterline

If the boat is out of the water, perhaps the first thing you should look at is the below waterline hull. A professional surveyor will carry out a moisture reading using specialist equipment but in the meantime there is plenty for you to look for. Osmosis can be easily seen if it has reached the stage where blisters in the hull are obvious. If you find blisters, try squeezing one with your thumb nail and see what comes out. If the liquid has a vinegary smell, it is almost certainly osmosis. Be aware



A surveyor will test hull moisture readings

though, sometimes the blisters are just in the antifoul paint and all that is behind them is some water. Osmosis does not spell the end for a boat, but



Osmosis can be expensive to treat, so boats affected tend to reflect it in the price they realise

fixing it is expensive and, if you decide to go ahead, should be taken into account when you make your offer. Equally, a boat with osmosis can be bought, used and subsequently sold without it being attended to, but the next person is going to want a decent discount, so make sure you negotiate one for yourself.

While you are under the hull, look for longitudinal stress cracks, particularly around the chines and spray rails. An antifouled boat out of the water helps here, as the cracks often retain water, darkening the antifoul paint and making them more visible.

Thwartships stress cracking is normally associated with internal bulkheads, so look for these too as they could indicate movement of bulkheads and expensive structural problems. Also check for poor repairs by looking along the whole hull. If you can easily see a repair, it is a good indication that it has not been well carried out. If the boat has a bowthruster, check to ensure that the tube looks secure and that the gearbox and propeller are in good condition, that the anode is present and that there are no oil leaks.

Seacock intakes are another area for close inspection. Most boats have



Below the waterline will need a thorough check. Examine the antifoul, fittings and bowthruster

a least a couple and it is important to check that they are well fixed, but also that they are of a suitable material and in good condition. The main thing to look for here in metal skin fittings below the waterline is dezincification. This is indicated where the bronze metal is showing signs of pink colouration. If the skin fitting is painted over, take a coin and scrape a very small amount off to expose the metal. Other through-hull fittings such as a log paddle wheel or a depth sounder transducer can also be checked for condition and security.



Metal underwater skin fittings should be checked for signs of dezincification

Hull above the waterline

A walk around the hull will show up any mooring wounds, look particularly closely around the bow and on the stern quarters. Coloured gelcoat will be a bit more tricky, and therefore expensive, to repair. Coloured gelcoat also has a tendency to fade due to UV degradation. This can be brought back fairly easily with a really good polish and maintained with copious wax protection, but this tends to be an ongoing job and worth bearing in mind when thinking about older boats with coloured gelcoat. With your head resting on the boat, look along the length of the topsides for any poorly repaired damage. GRP topsides are rarely perfectly smooth, and a few minor mould marks are to be expected, but any large areas of uneven





Faded dark gelcoat can be polished, but damage will be harder to hide

or rippled gelcoat should be investigated further. Properly repaired damage is not a reason to walk away, but knowing it is there, you can at least point it out to the surveyor for closer scrutiny. Some builders use plastic skin fittings on the topsides. These are often only just above the waterline and can be badly degraded by UV. If the surface is crumbly, they will certainly need replacing. Exhaust ports and engine room vents should also be inspected for damage and to ensure that they are properly bonded in place. The rubbing strake is another area where damage can often be found. The odd scrape is expected on an older boat, but

a very battered and worn strake may need replacing. The rubber insert on metal framed strakes is cheap and easy to replace, but fixing damage to the metal itself is a bigger, more expensive job. If the rubbing strake is rope or wood, check that it is not rotting, as these can be costly to replace. At the stern check the bathing platform for mooring damage and, if it is modular, good attachment.



Rubbing strakes, corners, mouldings and above waterline plastic skin fittings should all be checked

On Deck

Walk around the decks checking again for damage to the fibreglass. Impact damage is less likely here, but stress cracking may be found where decks meet uprights and around the base of stanchions and cleats. Check that the stanchions, cleats and any other fixtures are firmly fixed in place. If they are loose, water may well have found its way into the underlying fibreglass. As you walk around the deck, be aware of any areas that feel spongy. This could indicate delamination, or rot in the underlying structure. If the boat has real teak decks, these should get a thorough inspection for excess wear, damage or water laying underneath. The latter will be obvious as you will see and hear the water being squeezed out as you walk on it. Relaying real teak decks is time consuming and expensive. Plastic teak, doesn't have the same problems, but it is still worth checking that it is properly fixed down as water laying underneath may cause problems.



As you walk around the decks be very aware of any areas that feel soft or spongy



Deck fittings should be checked for damage or adjacent stress cracking to the gelcoat

Windows hatches and ports

Older boats often suffer from problems with the windows, hatches and portholes. Metal frames can corrode, wooden frames can rot, seals can shrink and plastic windows can craze and crack. Leaks are an obvious problem to check for. Look for badly applied sealant externally, as this is a sure sign that a previous owner was trying to cure a leak, and is likely to have been unsuccessful. Most window problems can be fixed quite easily, by fitting

new seals for example, but for bigger problems they may require removal, overhaul and refitting. Sometimes problems can be caused by lack of care and simply fixed by clearing moss away from the channels and drains.



Window rubber can degrade and become brittle, plastic can be scratched and crazed. Moss growth can cause leaks, and copious use of sealant could indicate poorly fixed leaks

Cockpits and flybridges

The first thing to look at here is the canvas work that covers these areas. Are they free from tears and damage? Is the stitching holding together OK? Do all of the zips work? Are all of the windows clear and free from damage? Most importantly, does the canvas still fit? As they age, canvas covers and canopies shrink to the point where they become impossible to correctly fix in place. At this point the canopy is likely to need replacement and, depending upon



size and complexity, this could easily cost a couple of thousand pounds. If the canopy is still mostly in good condition, but has a small amount of damage such as a single broken zip, a small amount of loose stitching or a torn window, these can all be easily and fairly cheaply repaired by any canopy maker.

Exterior seating is another area where big bills could await the unwary. Any seating that has been left exposed to the elements needs careful checking. Not only will the vinyl be weathered, but the foam may be waterlogged and any plywood bases may have started to rot. General grubbiness can usually be cleaned up, but tears and looses stitching in old vinyl seats can only really be overcome by being recovered and, like the canopy, this could



easily cost in the region of a couple of thousand pounds.

If the boat you are looking at has an exterior helm, especially one that looks like it has been left uncovered for any period of time, take a close look at all of the instruments and controls. Corrosion is likely to be found, and sometimes the instruments become damaged through water ingress and the clear dials become cloudy due to UV exposure.

Wood and steel boats

Much of what is written here is pertinent whatever the building material of the boat, despite it being mainly aimed at boats made from fibreglass. If you are looking at a wood or steel boat, you can still do your own pre-survey survey, but they will require a surveyor who specialises in the material, as they come with their own unique problems. With wooden boats, the enemy is rot, which will most likely be out of sight. With metal boats, corrosion is the killer. Any areas of soft wood, or rusty metal will need a proper inspection, but if you find lots of either, it is a sure fire indication that the boat is going to need some quite extensive work and, unless you are looking for a project, may be one to walk away from.

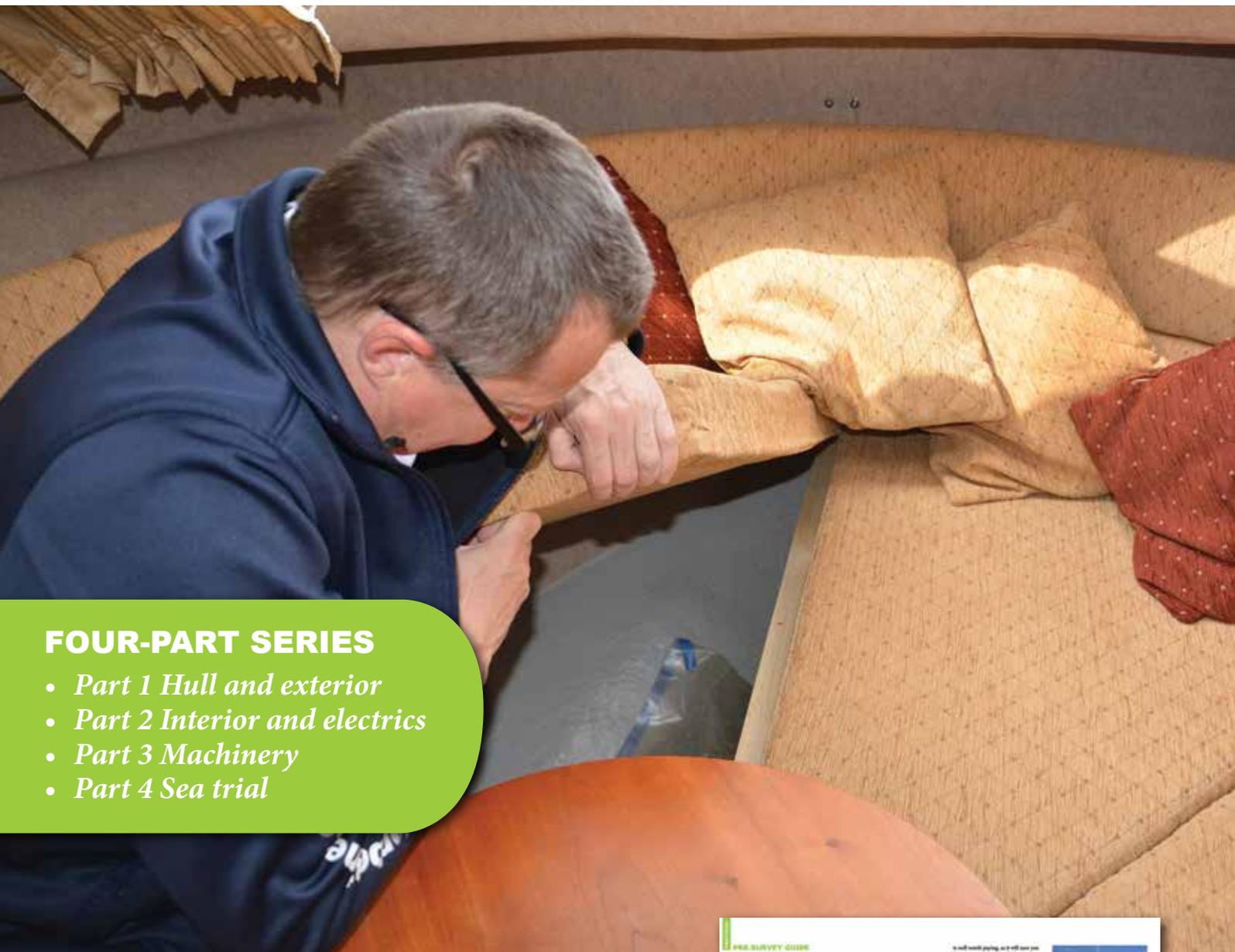


Before buying any used boat, always employ the services of a YDSA or a IIMS accredited surveyor and, if you have any doubt about the engines, a separate engine survey by a suitably qualified person is recommended.

PRE-SURVEY GUIDE

Used Boat Self-Survey

PART 2



FOUR-PART SERIES

- Part 1 Hull and exterior
- Part 2 Interior and electrics
- Part 3 Machinery
- Part 4 Sea trial

Welcome to part two of our guide to buying a used boat, and what to look for before committing to an offer and a professional survey. Last month we talked about what a buyer should be looking at on the exterior of a potential purchase. In this issue we move inside the boat and examine the possible pitfalls that may lurk on some used vessels.



Last month in Part 1 we looked at the hull and below the waterline



Interiors

A boat's interior can be its best selling point, or its Achilles heel. It is easy to look at a bit of damaged gelcoat and imagine it fixed, or a broken propeller and take into account the cost of replacement, but if you step onboard a boat and the interior is damp, dark, messy and smelly the viewing will often go no further. Sometimes though, you have to look through this, as many a gem has been hiding behind an uncared for interior. Equally, it pays to look closely, as replacing interiors that are damaged, beyond a simple clean, can get very expensive.

A good place to start is at the bottom. Finding a serious problem lurking in the bilge may allow you to quickly move on to your next potential purchase. Start by lifting up all available floor panels, excluding the engine room, as we will cover that next month. Stick your head down and have a good sniff. How does it smell? If you get a strong smell of diesel, petrol or effluent, the chances are there is a leak in one of

these systems. It could be as simple as a loose hose, but try and track down the source as on older boats it is common to find fuel and water tanks that are corroded and need replacement. This can prove to be a significant job that may entail removal of the engines or



You should lift up every access panel that you can to allow a full inspection of the bilge area

parts of the boat's structure. If the smell is of petrol, or gas, you may want to consider abandoning the viewing and report your findings to the boatyard and/or broker. Any boat with petrol or gas vapour in the bilge is not one that you want to be hanging around on for too long.

A slight damp smell in the bilge is not uncommon, and is not really something to worry about. It is fairly common for boats, even new ones, to have a bit of water in the bilge and, if this has been left standing for any length of time, it may start to stagnate. If there is a significant amount of water in the bilge, this is again something that needs investigating. Determining if it is salt or fresh water may give a clue as to its origin, but I'll leave it up to you as to how you find this out.

While you are looking in the bilges, use a torch to examine all the inside of the hull that you can access, as well as all of the stringers, bearers and bulkheads. What you are looking for is evidence of damage, or poor repairs, to



Check the operation of seacocks and inspect for corrosion or evidence of leaks



Diesel in the bilge could indicate a big and expensive problem, so check carefully

the hull and cracks where the hull meets any stringers, bearers or bulkheads. It is not uncommon to find the odd bit of fibreglass tabbing showing signs of cracks or delamination, so make a note of any you see and, if you proceed to a full survey, ask the surveyor to give these areas very close scrutiny. Any large cracks, or lots of small ones, together with evidence of any shifting, probably means the boat has had a hard life and may require extensive repair work or strengthening.

The last check to make while down in the bilges are any seacocks. You should be able to work out how many there are, and where they are, from the outside of the boat. Check the condition of them in terms of corrosion, check the hull around the seacock for evidence of leaks and gently try and open and close each one, always leaving them in the position you found them. They

should operate freely. If one feels stuck don't force it. Remember it's someone else's boat and you don't want to break anything. Just log it as a potential issue that needs sorting if you take the purchase further.

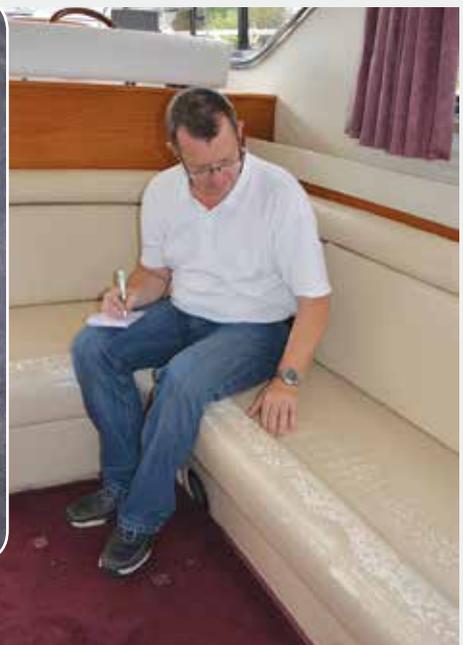
Working your way up, the next step is to look at the carpets and flooring in every cabin. Leaks often seem to accumulate in a corner somewhere so look for any sodden areas of carpet, or any stains that might indicate they were wet at some point. Tracing interior leaks is not easy, but knowing there is one somewhere will at least forewarn you. If the carpets are just generally grubby, they will almost certainly clean up with a proper carpet washing machine, and this will be easier and cheaper than replacing them. The same applies to other soft furnishings. Seat cushions and mattresses that are not damaged can be relatively easy to clean. If, however, there is damage to the material, you need to take into account the cost of a re-upholster if you decide



Wet carpets indicate a leak, but can be dried and cleaned. Stained carpets may need replacing, which can be a tricky job

to make an offer. Maybe consider getting a quote from a local firm before the offer stage.

The next step is to look beneath the soft furnishing and inside any cupboards and lockers. Again you are looking for any movement or cracks. The same applies to interior mouldings



Like carpets, dirty upholstery can be made to look like new again, but damaged cushions will need re-covering

such as a galley unit, seating modules or heads compartments. These are often fixed in and made waterproof with sealant. If the sealant has separated, it could be just that the sealant is old and has dried out, or it could be because the moulding has moved. If you suspect movement, try to grab hold of the moulding and gently wiggle it. It should be solid, so if there is movement this may be another area to point out to your surveyor, if it reaches that stage. You should also look upwards at any headlinings or overhead panels and make sure that the material is still nicely fixed in place and that damage is minimal, or at least concurs with the age and usage of the boat. This last point is important to remember. At all stages of inspection, you have to take into account that you are looking at a used boat. You cannot expect it to be as immaculate as the day it left the factory, when you are paying a fraction of the price when new. Loose headlining may indicate damp but it can also just be a sign of age where the foam backing has started to deteriorate. In these cases you are unlikely to be able to stick them



Damaged cabin headlining makes a boat look very tatty, but can be replaced at a cost



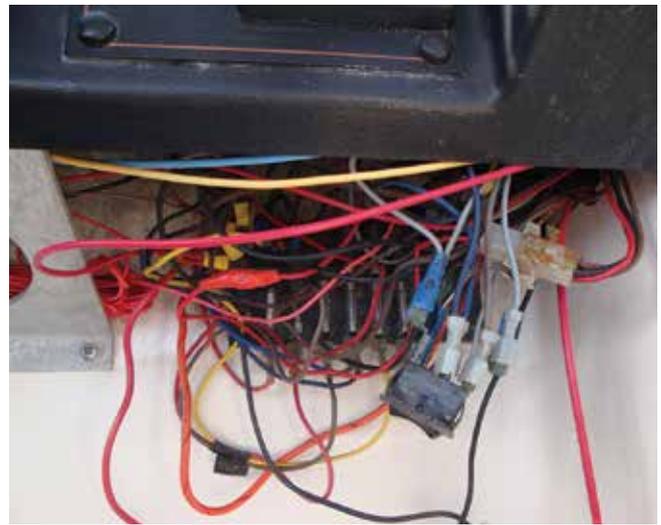
Woodwork damaged by water may just need a rub down and some new varnish, but rotten wood will need removing and replacing

back in place, as the backing foam turns to dust, so you either have to choose to live with it, or take into account the cost of replacement.

Poor condition interiors are often caused by leaks, so it is important to carefully check around all of the windows, ports and hatches for signs of water ingress. The headlining or cabin lining may be stained, the carpet, furnishings or mattresses beneath a hatch may be stained or wet, and woodwork below windows can be damp, rotten, or have varnish peeling due to water ingress. Leaking windows and hatches can sometimes be very simple to repair, maybe requiring adjustment or a replacement seal, but may also require complete removal and refitting with new sealant. If you find white powder residue around any stainless steel window frames, it is likely that there is an element of aluminium in the construction of the frame, which is corroding. In the long term, these may need replacing and that will prove to be a very expensive job, possibly requiring custom made hardware.

Electrical systems

Moving onto the boats electrical circuits, first impressions go a long way. If the cables that you have seen while looking around the boat are all neat and tidy, there is a good chance that the electrics have been well cared for and faults should be few and minor. If, however, you find a veritable birds nest of messy cables, possibly joined with chocolate block, or snap lock connectors, you can guarantee that the boat will be hiding some serious electrical gremlins. Depending upon whether the boat is on or out of the water and whether it has power connected, you should at least be able to test some of the boats 12 or 24V DC electrics. The only exception be a boat that has had the batteries removed. If you are a serious buyer, I don't think it unreasonable for the owner, or broker, to ensure the boat is powered up for your viewing, as long as you request the fact in advance and with enough notice. Test every circuit, every light and every 12/24V appliance that it is feasibly possible to. Don't forget the hidden stuff such as trim tabs, power trim if the boat has an outboard or outdrives, and the anchor winch. You should also find the float switches for any automatic bilge pumps and ensure that they are operating correctly too. I would also like to see all electronic navigation equipment powered up and showing signs that they operate correctly. If you are buying a boat for a couple of thousand, it is to be expected that a few items may not work. If on the other hand your purchase is in the 10's or even 100's of thousands, it is



Messy wiring should ring alarm bells. If this is visible, what is it like behind the scenes?

not unreasonable to expect all, or at least almost all, electrics and electronics to work, and to take any non-working items into account when compiling an offer,

One word of advice though, is to leave everything as you found it, whether that be on or off. There may be a reason the owner has left something on or off, and it may not always be obvious. The only exception to this would be if you found a problem that could potentially get worse. I once viewed a boat that had the battery charger on. The batteries were bubbling and venting furiously, filling the boat with dangerous hydrogen gas. I turned the battery charger off, but I made sure I informed the broker that I had done so and why, and I also asked him to inform the owner.



Check every circuit is operational if you can

Before buying any used boat, always employ the services of a YDSA or a IIMS accredited surveyor and, if you have any doubt about the engines, a separate engine survey by a suitably qualified person is recommended.

Used Boat Self-Survey **PART 3**



FOUR-PART SERIES

- *Part 1 Hull and exterior*
- *Part 2 Interior and electrics*
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- *Part 4 Sea trial*

Welcome to part three of our guide to buying a used boat, and what to look for before committing to an offer and a professional survey. This month we are going to look at the boat's mechanical systems.

A used boat purchase is, quite possible, one of the largest financial commitments many of us will make. With a motorboat, there is no doubt that much of a used boat's financial value is tied up in the

engines and other machinery. With a mid-sized diesel engine and drive system retailing at around £30,000, it makes sense to do whatever you can to ensure that these parts of the boat are in tiptop condition. Interestingly, most pre-purchase surveys do not focus on the mechanical aspects of the vessel. They may comment on appearances, but are unlikely to delve into the working of these expensive bits of kit, or provide

any real useful information. That is why it is particularly important for a buyer to do some research for themselves, and, if necessary, employ a separate expert to look over the engines. Of course, the sea trial will also provide lots of useful information about the condition of a boat's mechanical systems, but if you can at least make some basic checks first, you have given yourself a head start.



In Part 1 and 2 we talked about the hull and interior. This month we look at machinery

MACHINERY - ENGINES

Inboards, sterndrives and outboards

The big one, and probably the one item that a used motorboat buyer worries about more than anything else. Whether your boat has a small outboard for its main propulsion, or a pair a whopping inboard diesels, the engine, or engines, will represent a large part of the boat's value. So, what checks can the layman make to ensure that they are in good, serviceable condition? The first thing to check is whether there is any service history. Engines that have a documented servicing regime, that complies with the manufacturers recommendations, means that you start on a very good footing. Any problems will almost certainly have been dealt with during their lifetime, and the



Whether the engine is an inboard or outboard, the basic checks are just the same

chances are that these engines will be in as good a condition as you can expect for their age. The next consideration is engine hours. Low hours are not always a good thing, as engines can deteriorate through lack of use, just as much as they can from being heavily used. I would rather have an engine with the right number of hours for its age, with a good service history, than a very

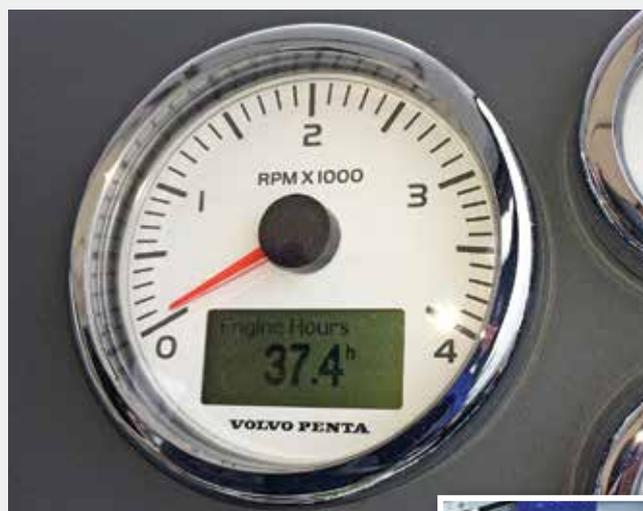
low hour engine with none. But, what constitutes the right number of hours? A good yardstick is around 50 hours per year, ideally with evidence that those hours have been clocked up reasonably evenly throughout the engine's life.

Unfortunately engine hour meters are not always a good indication of the hours an engine has run. Many will have stopped working, some will have been replaced, and lots of the digital displays from the 1990's will be blank. This is where you have to become a bit of a detective and use the boat's log and maintenance records to tie all of the information together.

Next it's time to get down into the engine room, or, if it is an outboard, remove the cowling. First impressions count here and the general cleanliness of the engine room, engine and other ancillaries will tell you a great deal about how well the whole boat, and particularly the engines, have been maintained. If the bilge is full of oily water, or the engine is covered in corrosion or salt crystals, you should start to question how well cared for



Some corrosion on old engines is inevitable, but if it is extensive it may indicate problems



Engine hours can be used to determine the kind of the life the engines have had



the boat has been, under its present ownership. Equally, if the boat is old, keep your expectations realistic. A 20 year old engine and engine room are bound to be showing some signs of their two decades of use. This is where viewing a few examples of the same, or similar, boats start to pay off. You will get a feel for just how an engine room of that particular age should look, and good ones or bad ones will start to jump straight out at you.

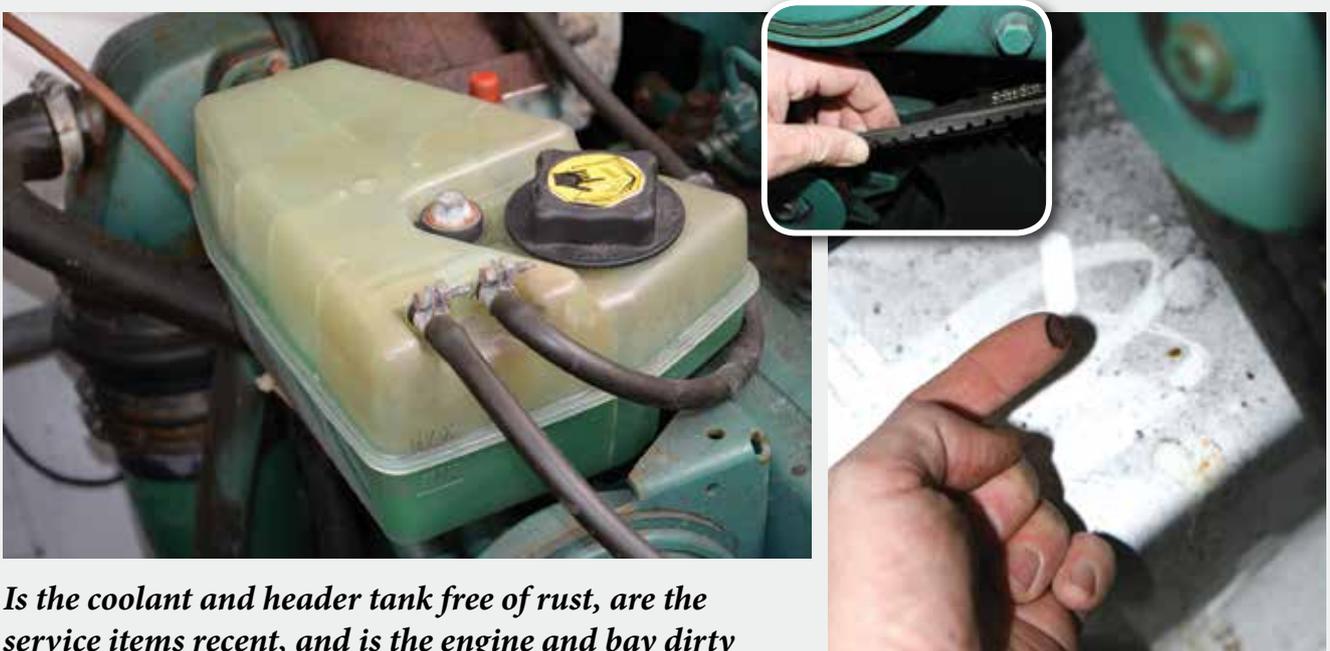
Looking over the engine itself, check for evidence of water or oil leaks. Again, old engines may have some minor leaks, but even these should be used as part of the bargaining process, with a view to getting them fixed, if the sale proceeds. Areas to pay particular attention to are around the water pump, exhaust components and crankshaft. Oil leaks from the latter could be quite labour intensive to fix. Evidence of extensive corrosion on the engine or its components should raise concerns and may indicate a long standing leak.

The next thing to do is check the engine's service items. This can help to back up the service history paperwork. If the oil and fuel filters look like they have never been changed, but the paperwork says the boat has just had a service, it's time to start asking some searching questions. Also check the condition of any belts and pull the oil level dipstick to ensure the oil level is correct. You should also check the colour and condition of the oil. It should be golden brown if the engine has just had an oil change, or a nice gloss black if not. Any hint of milkiness of the oil means it has water in it, which could indicate a head gasket issue, or other serious problem. Also, pull the oil filler cap and look on the underside of it and down into the valve gear. This is another area where milky oil will collect, if there is water in the oil. It is also a good idea to open the coolant header tank on an indirect cooled engine. If the water inside is a rusty brown colour, it indicates that



Check the oil via the dipstick and oil filler. Look for evidence of water contamination

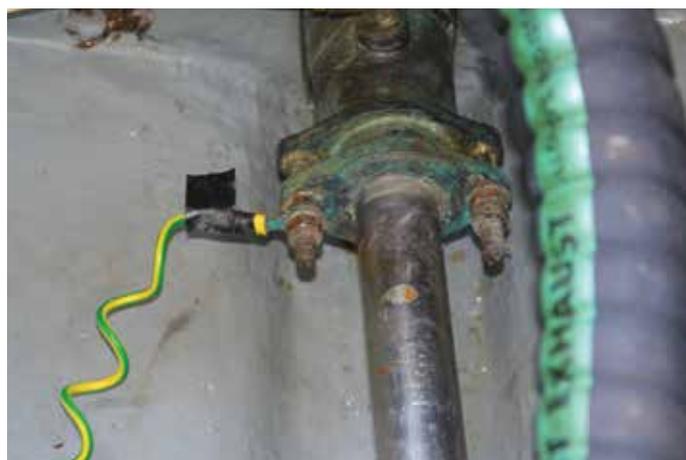
coolant changes have not been kept up to date and the engine's internal components are starting to degrade. Even if the coolant is a nice green/blue/yellow colour, but the header tank itself is stained rusty brown, this tells you that the boat at some time has been allowed to run for too long with old coolant, or has suffered from overheats at some point.



Is the coolant and header tank free of rust, are the service items recent, and is the engine and bay dirty

Shaft Drive

If the boat you are looking at is shaft driven, then you can check the gearbox oil level, oil condition and check for leaks. You should also check, as best you can, the condition of the stern gland. If the boat is afloat, is it leaking excessively? If it is a traditional stuffing box type, does it look well maintained with further adjustment available? If the boat is on the hard, get underneath and check that the stern tube is well fixed to the boat, that it is damage free, and that the shaft sits centrally within it. If it looks offset, this could indicate an alignment problem or a bent shaft. If the boat has a P or A bracket, grab hold of it and ensure that there is zero movement. Check the propeller for damaged blades and ensure that the rudder is well secured and in good condition. All of the underwater gear should be checked for corrosion problems. The shaft usually suffers in the areas you can't see, but the bronze parts, such as props and



Inspect the underwater sterngear for damage and corrosion. Is the stern gland in good order?

rudders, should have a good bronze colouration to them. Any hint of pinkness indicates dezincification and may require replacement.

Sterndrive

Old sterndrives can be a money pit if they have been neglected. First you should check that items like the U joint and exhaust bellows are in good condition, commensurate with the service history. They should have been replaced within the last two years at least. Any cracking of the rubber would be enough to worry me. Any splits or holes, particularly in the U joint bellows, and I would be walking away. Anodes should



Sterndrives should be well maintained and mainly corrosion free. A split or damaged bellows is likely to mean an expensive bill

be within service. It doesn't matter if they are near the end of their life as long as there is enough left to be doing their job. Corrosion on the drive body is inevitable to some extent, but if it looks extensive, to the point where it is more than just on the surface, I would be concerned. In worst case scenarios, the corrosion can go right through the body, losing all of the oil and exposing the gears to the water. In this case the drive is almost certainly a write off, and will need expensive replacement. Many drives will have aluminium props, and these are easily damaged and also susceptible to corrosion. Bear in mind a new set of aluminum duo props is around £500 when making an offer on a boat with damaged or corroded propellers. While checking the props, look behind them and see if there is any oil around the back of the hub. Drive shaft seals are a common failure and, although not expensive to replace, may have allowed water into the drive. If you can, pull the dipstick from the top of the drive and check the condition of the oil. If the boat has been recently run, milky oil here indicates water ingress. Unfortunately, on a boat that has sat idle for some time, any water will gather at the bottom, which means it may not be evident on the dipstick. The only way to tell would be to drain some oil off from the bottom, which is beyond the scope of your initial inspection but maybe something to bear in mind if the sale proceeds. Another area of concern should be the power trim and tilt. Check the rams for evidence of oil around the end seal and,



Sterndrive trim or steering rams should be checked for hydraulic leaks. If you can, inspect the drive oil for water contamination

if you can, extend the drive upwards so you can check the operation of the trim as well as slowing access to check the shaft of the ram itself. Any corrosion or pitting on the shaft will require replacement, as a leak will not be too far away. New rams could be as much as £500 each and, if you have four that are all leaking or damaged, you are looking at a hefty bill. Not only that, in some rare occasions, you have to remove the engines to allow removal of the rams. Some rams can be repaired in situ with a new seal kit for considerably less but, do your research first to ensure that yours can be repaired in this way. Lastly, get a good firm grip on the drive and see if there is any movement that might indicate worn components. A small amount of side-to-side movement is acceptable but it should be pretty solid in the up and down plane.

Outboard Gearboxes

Like a stern drive, the gearbox is prone to water ingress. Without a dipstick, the gearbox oil can only be checked by draining, so it is important to look for evidence of an oil leak from the shaft seal behind the prop. Also check the condition of the aluminium propeller.

Small amounts of damage on aluminum props can usually be repaired for considerably less than the cost of a replacement. If, however the prop is weakened by corrosion, replacement is probably the only option. Also check again for corrosion to the gearcase and the condition of the anodes. If the outboard has power trim and tilt, check the operation of this, and that there are no oil leaks from the hydraulic ram, pipework and pump.



MACHINERY - OTHER SYSTEMS



Trim Tabs

While you are working around the transom, you should check the trim tabs. If they are hydraulic, check for evidence of oil leaks. If they are electrically operated, with externally mounted motors such as Eltrim models, check that the small rubber gaiter is in good condition, as water ingress here will ruin the motor. If you can power up the tabs, ensure that they

both go fully up and down and that they do so at a similar speed. Electrically driven ones that operate slowly is an indication that the motor may be failing.

Other engine room checks

Back inside the engine room, check the oil reservoirs for any drive trim, or trim tabs. The oil, usually red in colour, should be clear. If it looks like strawberry milkshake, then there is water present. Also while here, inspect the boat's batteries. They should look clean and be free of any bulging of the casing and any corrosion on the terminals. If you haven't yet checked the fuel tanks, here is another chance. Look for evidence of leaks or corrosion. Replacing tanks is a labour and cost intensive business.





Generators If the boat you are viewing has a generator set, treat this as another engine. Check for evidence of a good servicing regime and check the condition of the oil and the coolant. You will also want to see and hear the generator running at some point. If it is not possible to do so at this stage, add it to your list of checks for the sea trial.

Bowthruster

Hopefully you have already checked the outside of the bowthruster while inspecting the hull. On the inside, check again that the tube is firmly fixed, with no signs of cracking or delaminating. Check that the motor is correctly and neatly installed and that the wiring is in good condition. If the thruster has its own battery, ensure that this is secured in place and free of damage. Some thrusters have a separate oil reservoir and a pipe to feed it to the gearbox. Check that this is topped up with clean oil and is all leak free. If the boat has a stern thruster fitted, carry out the same checks for that.



Fire systems

I would put money on the fact that more than 50% of portable fire extinguishers onboard all of the used boats for sale in the UK, at any one time, are out of service. On any boat, see these as a service item and expect to replace them, they are not expensive and the cost of getting them serviced will often outweigh the cost of a replacement.

Engineroom systems are a different matter. A good automatic engineroom system can run to quite a few quid, so if there isn't one, or the one installed is old and past its service date, it would be fair to throw the cost of replacement into your calculations when making an offer. Don't be surprised to find outlawed Halon extinguishing systems on some older boats. These will certainly need replacing, and you also get to deal with the difficulty of disposing of this greenhouse gas.



Gas With gas systems there is little that you can check. The flexible hose from the regulator should have the manufactured date printed on it. There are no specific recommendations for how long the service life of this hose is, but 5 years seems to be accepted as the norm. Luckily there is usually only a metre or so, so replacement cost is insignificant.



You should check, as best you can, the integrity of the gas locker and any exposed pipework and joins. If possible, and with the owner's or broker's permission, you could test the flame failure device on all burners by lighting them and then listening for the clunk of the solenoid closing after extinguishing. Any gas appliance without a flame failure device, or with a faulty one, should be changed.



Heating If the boat is fitted with diesel fired warm air heating, you should test this for operation. They are a great option to have, and in my mind worth paying a bit more for a boat with one fitted, but if you are paying more, you really should ensure that it is working. If this can't be done at this stage, it's another job you could add to the list for sea trial day.

By now you should have reached a stage where you have a good idea of the work the boat may need to bring it up to scratch. Using this information, you should be in a position to make an offer if you wish to proceed. The offer should be subject to survey and sea trial, and confirmation that items you may not be able to test until sea trial, such as generator, heating, bow thruster etc, are in good working order. It goes without saying that the sea trial is mostly about checking the operation of the engines so this doesn't need to be implied.

Once your offer has been made, and accepted, this is the time to employ the professional surveyor. You don't have to do this, and indeed on small value boats you may deem it unnecessary, but I believe that if the cost of the boat is a significant amount to you, a survey is well worth getting for peace of mind. Without doubt, a surveyor will find things that you didn't, They are, after all, trained to look for them. They also have access to kit and experience that you cannot replicate. With the survey in hand, and assuming nothing of a material nature was found that makes you decide to pull out of the purchase or renegotiate your offer, it is time to organize the sea trial.

Before buying any used boat, always employ the services of a YDSA or a IIMS accredited surveyor and, if you have any doubt about the engines, a separate engine survey by a suitably qualified person is recommended.

NEXT MONTH > We look at how you should conduct a sea trial, and what to look out for

Used Boat Self-Survey **PART 4**



FOUR-PART SERIES

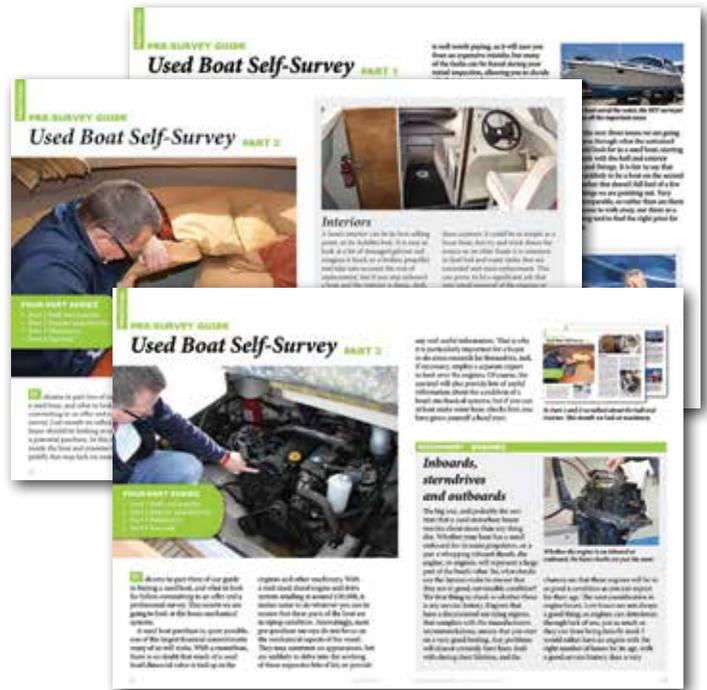
- *Part 1 Hull and exterior*
- *Part 2 Interior and electrics*
- *Part 3 Machinery*
- *Part 4 Sea trial*

In this, our fourth installment of used boat buying advice, we are going to look at the sea trial.

The sea trial is usually considered to be the final phase of a used boat purchase. After you have carried out your own inspections, as per our previous three features, and you have decided that this boat is for you, you need to decide on how much you are going to offer. The offer should be based on the market value

of the boat, which you should be able to work out based on other examples for sale, less any work that you have decided the boat needs to bring it up to scratch. If the boat is already cheaper than all the other examples on the market, you have to accept that this may be due to exactly the things you have found, so you can't always expect to get a further discount because of them. Once you have decided what the boat is worth to you, the next stage is to

make an offer, subject to survey and sea trial. If the offer is accepted, you may be required to pay a deposit of around 10% at this stage. If the survey throws up any big issues, this can be used to re-negotiate, or back out of the deal, but if you have done a good pre-survey inspection, the likelihood is that you can proceed onto the sea trial. It is worth noting that a few small problems found at the survey are not usually considered to be enough to renegotiate. It is expected that most used boats will have some minor issues, and this is why your pre survey inspection is important. Hopefully you will have already found the little problems, and made your offer based on your findings.



In Part 1, 2 and 3 we talked about the hull, interior and machinery. This month, in the final part of our guide, we look at the sea trial

Sea trial expenses

A sea trial incurs some expenses, such as fuel and lifting costs, and there are no hard and fast rules about who pays for these. If the broker operates their own crane, they may be happy to launch the boat for free, or at least at a reduced cost. If you need to bring in an outside contractor, then normal lifting rates will apply. If the boat was in the water during the initial inspection and offer phase, you will certainly be required to pay for the lift out for the survey, and then the lift back in again for sea trial. Fuel costs are often ignored, as the boat usually has some fuel in the tanks anyway, and if the sale proceeds, which is most likely at this



You may have to pay for the boat to be lifted in

point, the buyer is effectively using his own fuel anyway. If, after the sea trial, the sale falls through, it may be argued that you should contribute to the costs of the fuel used. If fuel needs to be put into the tanks for the sea trial, you will almost certainly be asked to pay for it, or at least contribute.

Insurance and qualifications

As a potential buyer you will not be expected to have insurance to drive the boat, or even be experienced or qualified to do so. For this reason, the owner or broker should be with you and in charge of the boat. They will, of course, let you have a drive, so that you can get a feel for how it performs, but don't expect to be able to take it on or off the pontoon.

What a sea trial is not It is important to understand that when you make an offer, you are entering into a contract, and for you to get out of that contract requires a valid reason. A material defect found during the survey, or a planing hulled boat that won't go above 8 knots, or overheats if you try, would be a good reason. Not liking the driving position, realizing it is difficult to get on and off, or finding out it will only do 25 knots when you want to do 30 knots, even though the boat only ever had a 25 knots top speed is not. For this reason, this is all stuff that you should have looked into before making the offer. You should go into the sea trial knowing how fast the boat should go with the engines fitted, what the maximum RPM of the engines should be and have some idea of how the boat handles and performs, maybe from researching an old boat test or an original brochure. It is this kind of information that the sea trial is used to determine, that the boat does what it should, and not whether you like the way a boat with sterndrives handles having come from shafts, or vice versa.

SEA TRIAL - THE PROCESS

At the dock

If the boat has been out of the water up until now, the first thing to do is check for leaks. Open up the bilges and look especially closely around



seacocks and in the engine room. A small amount of water may already have been present when you looked when it was ashore. Has the amount changed? If there is any water in any bilge area, make a mental note now how much there is, so that you can check again at the end and see if it has increased. While you are in the engine room, check also for any oil leaks. The idea is to see if any appear during the sea trial, or get worse if they already exist. It should be down to the owner or broker to ensure that normal start up checks such as oil and coolant levels are OK, and engine seacocks are open, but it pays to ask the question or have a quick check yourself.



Starting up

I would always prefer to be present when the engines are first started from cold. This is not always possible, as the boat may have needed to be run when launched, but pre-warmed engines can sometimes hide a problem. When the engines fire up, check the exhausts for smoke. A little is normal, especially on older boats, and should clear quite quickly, but excessive blue smoke with an oily smell could mean the engines are burning oil due to internal wear. Then listen to the engines. How do they sound, and are there any unusual noises or excessive vibrations? If possible, check for coolant flow. Outboards are great for this, and you should look for a good strong flow from the tell-tale, but on many inboard engines there is no way to check, unless they have a tell-tale built in like some Broom boats, or they have a transparent raw water filter lid. Before casting off, have another glance over the engines for any water, exhaust or oil leaks.

Underway

As you leave the pontoon, you will probably not be driving, so this is a good opportunity to watch the gauges and see if everything looks OK as the engines start to warm up. Oil pressures should jump up to normal as soon as the engines start and stay there for the duration. Temperatures should slowly rise



Check voltages are up at around 14v and the oil gauges, if fitted, are registering good pressure



Do the engines go in and out of gear easily and smoothly, and are the temperatures normal

to somewhere in the region of 80-90°C and stop. Once you are out in open water, the temperatures should be approaching normal and you will be offered the chance to have a drive. This is your opportunity to be methodical and run through a pre-planned list. You don't need to rush, as most brokers will expect a sea trial to be about an hour or so, but will happily extend that if necessary. It helps if you have everything written down in a list before hand, so that you don't miss anything in the excitement of getting behind the wheel of your potential new boat. Number one on the list is to drop the engine, or engines one at a time, into and out of gear, in both forward and reverse. Does it go into gear nice and smoothly, without any odd noises? You will get a clunk on some outboards and sterndrives, but otherwise the gearshift should be smooth, easy and quiet. Next, while still in neutral, I would check that the power trim and trim tabs appear to work, at least according to the gauges. You will check that they actually work once underway. If the boat has a bow or stern thruster, turn them on and make sure that they thrust well in both directions. With the engine/s in gear and in tick over, check that the steering is responding correctly, has full travel and feels smooth.



Before putting any speed on, check the operation of the trim tabs, power trim and thrusters



Speeding up

Now you can start to build up some speed. Open the throttles and bring the boat up to cruising speed. On a planing hulled boat, this will be somewhere in the 18-26 knots range, and on a displacement boat the 6-10 knots range depending upon boat length. The power should be delivered, and the speed should increase, smoothly. If the engines are supercharged, you should hear and feel them drop in and out at the relevant RPMs. If the engines are turbocharged, you may hear these spin up once the engines are running fast enough. Again, check behind you for smoke, listen to the engines for any strange noises and keep an eye on the temperature gauge, which should remain in the 80-90° sector. With the boat running at cruising speed, check the RPMs and the speed against what your research showed you should expect. Remaining at this speed, you can now carefully check the operation of the trim tabs and power trim if fitted. Lowering one tab down at a time will quickly tell you if they are working. Using power trim, raise and lower the drive and check for a response. With the trim set correctly, you should try a few turns to make sure that everything still feels right and the boat responds properly at speed. Unless you are buying a race boat, full speed, full lock turns are not really necessary, and will probably only scare the broker anyway. Always let everyone on board know what you are about to do, so that they are not caught unawares. If the boat responds well at cruising speed, you can be assured that all is well with the steering. Cruising speed is also a good time to check a few of the instruments. Do the speed and depth instruments work correctly? If the boat has one fitted, fire up the autopilot and check that it can maintain a course. Program in a couple of 20 or 30° turns in both directions, to make sure it responds as expected.



Check the boat responds as expected



Full speed

If all is well, particularly with regards to the engine temperature and control systems, it is time for a full speed run. Find some nice flat water, inform your crew what you are going to do, and open up the throttles fully. This is an important test for the boat as it will tell you much about the condition of the engines and drive train. First you are looking for the maximum RPMs achieved by the engines. Then you are looking to see what speed is achieved. On an outboard or sterndrive boat you will need to trim out a little to get the best results. Trim a little at a time until the speed no longer rises and you have found the boat's maximum sweet spot. Make a note of these to compare with your figures researched before the trial. You have to remember that a boat on sale is usually quite lightly loaded, so the speed achieved on this test is unlikely to be replicated once the boat is loaded up. It is worth checking the water and fuel levels to see just how lightly loaded the boat is. If they are both full, and you still achieve maximum speed, that is a good sign. If



almost empty, and you are a few knots shy of expected, there may be a problem. If possible, hold the boat at full speed for at least five minutes. You need to check that the engines do not overheat at full load. Many boats will happily cruise all day at normal temperature, but will overheat when opened up. This normally indicates a slight blockage of part of the cooling system, that will, in time, possibly get worse.

Other checks

While afloat there may be a few other boat systems that you have not been able to check yet. If the boat has one fitted, fire up the generator and make sure it runs and supplies power as expected. Ideally you want to leave it running for long enough to ensure that it doesn't overheat. If you can put a heavy load on it, such as a kettle or immersion heater, all the better. Other expensive systems that may need checking include air conditioning and heating. If you are buying a boat on the basis of it having these items installed, and paying more because of it, it makes sense to see them in operation.



Heading back in

At this point you can hand control back to the broker, or owner, and head back in. Once tied up, and with the engines off, have a final check in the bilge and engine room for leaks, either from the hull or from the engines. If the sea trial threw up any major issues or concerns, these should be raised now. A material problem means you can still back out of the deal and expect your deposit to be returned, although you will be out of pocket on survey, fuel and sea trial fees. You may choose to renegotiate either a lower price to get the problem fixed yourself, or request the problem is fixed before proceeding. The seller, of course, may not accept your request and leave you to decide whether to proceed without the problem being sorted, or back out of the deal altogether. If everything went well out on the water, and the final engine room and bilge check reveals no problems, the final part of your boat buying process is done. All that remains is to sort out the bill of sale and hand over the money. Almost every boat has a file full of paperwork and manuals. Make sure that this is handed over at this stage, as it is quite easy to forget in all the excitement. In anticipation of a successful sea trial, you should have requested some quotes for insurance, and once the deal is done you should put the boat on cover immediately. You will now need to talk to the marina/boatyard about keeping the boat there, or lifting it out ready for transportation, but the broker will normally be very happy to help with these arrangements. Now the real fun and adventures begin.



Before buying any used boat, always employ the services of a YDSA or a IIMS accredited surveyor and, if you have any doubt about the engines, a separate engine survey by a suitably qualified person is recommended.