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## Boat Checks – By Angus Belcher      © Angus Belcher 2015

### **Boat Checks**

Last week, on a short, local delivery I, once again, found myself cramming my, not insubstantial frame, upside down, into an engine room to fix a problem whilst rolling violently from side to side and banging my head on the turbo unit. This got me thinking about putting on paper the sorts of checks we should make pre-trip and during our cruise.

Of course, owning our own boat means that we regularly check things, make small repairs, have the boat regularly serviced and have a good idea of its history; this means that we will often know of little niggles and issues that may cause us a problem and be ready to fix them. It's worth noting, though, that if we're about to set off on our two week West Country cruise we may be about to use our boat for more hours than it's clocked up in the last twelve months.

Just so that I don't forget anything, we'll look at this as if we're stepping on to the boat for the first time and setting out on a long trip.

### **Check the Boat**

The beginning of the season is a great time to carry out a mini survey of our little ship; something that, as owners, we should do every few months to throw up any issues long before they're a problem at sea.

History – The history of the boat is important, where has it been living, how much has it been used recently, has it been regularly serviced and how many hours has she done each year. Whilst this doesn't show up any actual problems it will certainly tell us if the boat needs a professional appraisal and perhaps a lift, wash and service before setting out.

Engine hours can give us a false sense of security. A boat that has only clocked up 200 hours in the last six years sounds great, 'like a new boat' I hear you cry, 'only just run-in', but any delivery skipper will get the heebie-jeebies about setting out on a 20 hour trip on a vessel that has only run for about 30 hours in a whole year. Engines like to work, it keeps things moving, parts lubricated and joints and seals as they should be. We'd certainly want to run the boat locally for a while before setting out to sea as use of the boat brings to light all the little things that a static inspection might miss.

**General Condition** - We'll look around at the general condition of the boat. Start outside and look at windows, hatches and covers; spending ten hours with water dripping on our heads is no fun. I did once turn up to teach on a beautiful old wooden cruiser to find the proud new owner gaffer-taping the bottom of the wheelhouse to the deck, he said "I found some rot so I cut it out and it's left a big hole round the bottom". Well, at least he'd checked!

Is the bottom clean? A coating of green slime will slow the boat down and use a lot more fuel, decreasing our range and costing more money. Weed and barnacles make this much worse.

While we're still outside let's look at things like aerials, light fittings and wipers. Do the cockpit drains drain water away? Are lines and fenders serviceable?

## Engine Checks

Let's open up the engine areas and do some checks. Not our usual glance around and dip the oil, we're going to get amongst it here so we'll pop on some disposable gloves and grab a torch and some rag.



the coolant so that you can see the level at a glance. It's worth taking the cap off the heat exchanger to check there's actually coolant in the engine, a blockage in the expansion pipe can leave plenty in the bottle but none where it's needed.

Above the Raw water seacock there's usually a sea strainer, some have clear tops meaning that we can look in to check for weed or debris without taking the thing to bits. If we can't see in we should close the seacock and remove the top to inspect the removable basket. We need to be careful, when putting it back together, that the seal sits properly and the cap is

**Fuel** – Have we got enough for the trip.

**Oil** – Dip the oil and top up if necessary, be careful not to go over the full line, too much is as bad as too little. Take off the oil cap and look for white deposits that might suggest water in the oil.

**Cooling System** – Most modern engines have expansion tanks for



on and tight; it may not leak at tick-over but will pour water into the bilge at high revs if it's not fitted just right.

Gearbox oil – Check the level on the dipstick.

Fuel System – Look for leaks and corrosion on the supply system and look at the condition of the primary and secondary filters, if they look old and corroded then they haven't been changed for some time. There may be a glass inspection bowl at the base of the primary filter, we're looking for clean diesel without dirty deposits or water at the bottom.

Belts – Look at the condition of drive belts, are they frayed or giving off lots of black dust? Twist the belt through 90 degrees, if it goes any further it may need tightening.



Fire Extinguishers – Primed and in-date.

Connections – Take a good look at electrical, hose and pipe connections, hoseclips and hoses themselves, it's usually obvious if there's a problem.

Shaft Seals – On shaft drive boats, look at the condition of the seals round the propshaft. Do they look worn, is there evidence of leaking. On leg drive boats the drive system is

all encased in the leg but look around the area where the leg goes through the transom for leaks and if possible (don't fall in) look and feel around the rubber gaiters just outboard of the back of the boat for splits or damage.

Engine Mounts - check the condition of the mounts, look for corrosion and check the tightness of the nuts.

Batteries – We're looking for corrosion on the connections, tightness of the connections and battery condition. Many modern batteries have a little indicator window which is green for good amber for poor and red for dead.

Sea-cocks – Make sure the raw water seacock are open (in some stern-drive boats the sea water comes in the leg and they don't have sea-cocks). Open and close the sea-cock to make sure it works and check for corrosion or damage to the unit or the pipework.

Engine Condition – A general look around the engine and the bilge for evidence of leaks is a great idea. Keeping the engine clean in the first place really helps this. We're looking for diesel, coolant, oil or any other goo that shouldn't be there. If there is any, we need to find out what it is and where it's from.

Linkages – Throttle and gear linkages need looking at, the connections should be good and the outer cable firmly trapped in place by a little metal hoop.

## **Other Checks**

Let's go round the rest of the boat now and lift floor hatches, look in cupboards and find and check all the things we might need to find later when there's a problem. It's much easier to diagnose things when you know where things like the breaker panel or the seacock for the loo are.

**Seacocks and Pipework** – As with the engine seacock, check condition and open and close them. Toilet seacock may be best kept shut on a journey and opened only when needed. A boat, bouncing about in waves can put back pressure on the system and damage the seals, at worst this could end up in 'getting one's own back', a pretty unpleasant experience!

**Bilge Pumps** – Check that the electric bilge pumps all work and that the automatic float switches are functioning, that the filters are clear and the pump does pump water. Most boats also have a manual pump, as it's our last line of defence let's stick the handle in and check that too.

**Steering Gear** – Usually in the back of the engine room (sorry, we should have checked while we were down there) but sometimes in a separate stern compartment, we should take a look at the steering gear. We're looking at the tops of the rudder shaft, the connections to the steering system, the tightness of nuts and bolts and general condition. We're looking for loose or worn things. With a hydraulic system, we're also looking for steering oil leaks. This is a good moment to figure out if there's an emergency tiller and where it fits onto the steering. With hydraulic systems there may also be a valve that releases the pressure in the system allowing us to steer by hand. It's much easier to locate and test this now rather than at sea. On a Stern-drive boat, the steering gear may be much harder to get to and some of the system is located outside.

**Heads** – We checked the sea-cocks but it wouldn't be a bad idea to check that the loo works, turn on the sea-cocks and take the loo through its flush cycle, look for leaks and make sure the system is primed-up, loos that have been left for a while may have a couple of problems:- The system can lose its water and just pumps air or the system works but makes a terrible stink when it's flushed. Contrary to what you may be thinking, this terrible smell is caused by dead bacteria in the seawater which has sat in the intake pipe. Flush the system a few times and it will go. Much better to do this now while we can still air the boat.

**Gas system** – Because a cuppa is essential on any trip, check that the gas bottle is full and that the system is working. Shut the system down after use by shutting off the bottle, allowing the flame to go out then shutting the cooker off and shutting the gas tap. Be fanatical about this, if a bilge full of gas explodes we'll need more than gaffer tape and cable ties! It's worth checking the system for leaks while it's primed and switched off at the cooker, smear joints with fairy liquid and look for bubbles. A good gas alarm and a regular gas safety check and certification is essential.

Start-up - and warm the engines and look at the engines while they're running, watch for vibration or leaks and listen for rattles or unusual noises, do they run smoothly at idle or are they 'hunting' for fuel. Check that cooling water is coming out of the exhausts (on a stern-drive boat carefully watch the temperature gauges). Check that the oil pressure comes up.

Gears - While safely tied up we should put the engines in forward and reverse at tick-over to check that the gears work with ease. When going in and out of gear look at the shaft seals for signs of leakage. With stern-drives we're listening for unusual gear noises; raise and lower each leg to check the trim is working.

Under Load – If possible, with the boat tied firmly to more than one cleat fore and aft, run the engines in gear with just a few revs on and listen and look for unusual noises and vibration.

Electronics - Run up the electronics one by one, does the GPS get a fix? Does the radar work?

Lights and Horn – Switch on the navigation and anchor lights and check the horn works.

Wipers – Do they work? Do they look secure? (this is one of the most regular failures on a trip and is really aggravating!). Do the washers work.

Dimmers – Find out how to dim the instruments; night time at sea, when you can't see out of the window because of the reflection is no time to try to find this out.

Hatches – Are they all securely shut? (we were airing out the heads earlier!).

## **Spares & Tools**

We'll need some spares on board, some of which we probably have on the boat but it's worth double checking; and a basic toolkit with sockets, spanners, screwdrivers, knife, pliers and a few other useful bits such as mole grips, a filter wrench and an electrical meter. Don't throw away your plastic water bottles, these, cut down, make great little buckets for catching diesel and oil and the tops make really good funnels.

## **Spares List**

Oil, Coolant, Belts, Gearbox Oil, Steering fluid.

Replacement Bulbs,

Spare Impellers

Drive Belts

Fuel Filters - (Lots! If we need to change a fuel filter then we'll probably have to do it a few times).

Gaffer Tape  
Cable ties  
Wide Sticking plaster - (Brilliant stuff, it sticks to most things and itself).  
Wooden Bungs – a variety of sizes.  
Cord  
Small Ratchet/Grip Straps  
Rags (lots)  
Plastic Bags  
Clear Tubing  
Hose Clips  
Self Tapping Screws (a variety of sizes)  
Assorted Nuts and Bolts  
Electrical Tape and Connectors  
Assorted Cable  
Fuses

We'll think of other things and build a comprehensive kit but these should be a good start.

## Running Checks

Once we're underway, we should make regular checks of the engine spaces. Usually a look around the engine space with the help of a torch should be sufficient. We're looking for leaks, fluid in the bilges, listening for unusual noises or vibrations



and checking that no water is pumping out of the top of the sea strainer. Another important check is the shaft seals, we'll check visually for leaks and damage. It is really good to be able to check the seals for temperature, these are usually fed with cooling water from the heat exchanger and should be cool. One way to check is by touch but this can be a very dangerous check to carry out and is not recommended without first shutting down the engine. I've recently found a great little tool for this, it's a laser thermometer which you can point at things from a distance and it gives a digital temperature reading. A hot shaft seal is going to damage itself and may start letting water into the boat. A friend of mine solved this problem by wrapping my (new) Fat Face fleece around the shaft and securing it with wooden wedges and gaffer tape (it was never the same again) but rather than getting to this stage if we detect a hot shaft seal we should shut down the engine and carry on until we can solve the problem. We recently temporarily repaired a hot seal by a bit of neat DIY plumbing to get cooling water across from the opposite engine but only once we were safely alongside.

Keeping an eye on the gauges every few minutes is vital. This is our early warning system for the two most damaging engine problems; temperature and oil pressure. The gauges often read differently to each other but each will have a 'normal' position

when warm and at cruising speed, what we're looking for is change, if the temperature starts going up or the oil pressure falls we need to shut down and investigate. By the time the alarms go off the engine is already being damaged.

I've made up a couple of check and preventative maintenance lists that, whilst not comprehensive might act as a reminder sheet.

You can download them here:

Checks and maintenance are an essential part of all of our practical course...

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## Seaward Sea School

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## Planned Maintenance

Date:

**Inspected by:**

## Monthly

- Hull space visual inspection and clean
  - Drain water from fuel separators
  - Check deep sea seals for leakage
  - Inspect air filters for dirt/salt, clean or renew
  - Inspect exhaust system for leaks/corrosion
  - Check tightness of exhaust hoseclips
  - Check steering oil level
  - Lubricate steering rose joints
  - Check battery levels and vaseline terminals
  - Test all 12 and 240 volt equipment

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6 Monthly

- Inspect topsides for gel coat damage + repair
  - Powerwash and scrub hull and sterngear
  - Inspect hull and sterngear for damage
  - Check hull anodes and continuity of bonding
  - Check rudder bearings and p bracket for wear
  - Check wipers/blades
  - Antifoul if required
  - Check toilet operation and fit service kit if req.
  - Inspect gas installation, clear drains, tighten clips
  - Inspect engine and fuel hoses. Tighten clips
  - Inspect behind main distribution panel for corrosion
  - Inspect electrical connections
  - Check lifejackets
  - Check condition of anchor and chain
  - Check cooling water to shaft seals

## **Planned Maintenance - cont.**

### **Annual**

Attend to exterior varnish work  
Polish hull and superstructure  
Service liferaft

### **2 Yearly**

Fit toilet service pack (if 2yrs old)  
Release shaft couplings and inspect cutlass bearing area  
Renew shaft seals  
Inspect heat exchangers and clean

## Pre-trip Maintenance Checklist

Date:

**Skipper:**

## Course

These checks must be completed at the start of each trip. A daily maintenance sheet must be completed in addition to this checklist.

Lifejackets, condition and date
Flares, condition and date
Liferaft, condition and date
Warps and fenders, condition
Windlass operation
Anchor secure and easily released
Check and lube engine moving parts (where appr.)
Check seacock, condition and operation
Condition of pipework and fuel lines
Condition of fuel line unions at tank and injectors
Condition of calorifier unions
Coding paperwork and Training/maintenance book
Appropriate charts and equipment aboard
Fire extinguishers, dates and condition
Torches, in place and operational

## Daily Maintenance Checklist

Date:

**Skipper:**

## Course

Daily

## Pre-start

- Oil Levels
  - Coolant Levels
  - Belt tension and condition
  - Stern gland condition and seepage
  - Bilges, water / liquids
  - Bilge pumps operational
  - Liquids, leakage and general condition of engine
  - Gear / Throttle linkages
  - Auto fire system
  - Fuel levels
  - Liferaft secure
  - VHF radio test

## Post-start

- Cooling water from exhaust
  - Throttle / gear operation
  - Nav lights
  - Horn
  - Warning lights off
  - T and P guages operational
  - Steering function
  - Gps / radar function
  - Hatches Closed