



Armada Engine Checks - WOBBLE

Water - For cooling the engine, sea water comes in and exchanges heat with a fresh water / antifreeze mix in a separate system. The fresh water system then cools the engine. Check the seawater filter for obvious signs of blockage. You can open it if necessary to clear it. Next, check the level of liquid in the fresh water / antifreeze mix. The level should fall in between the marks for minimum and maximum. Top up the level if necessary, but remember that liquid expands when it is hot, so do not fill completely to the maximum level mark.

Oil - Engine oil - engine oil lubricates, and also cools the engine. Check the oil level with the dipstick, the level should be between the maximum and minimum marks. If the oil has a white milky colour then there could be a water leak into the oil system, indicating major problems! If the oil is thick and black then it is old and needs changing. Make sure you use the correct type of oil to top it up if necessary. Do not overfill - excess oil will burn in the combustion system and cause problems. Gearbox oil - lubricates the gearbox. Gearbox oil usually has a strong mineral smell and is green or blue in colour. The dipstick is usually inside a small yellow plug which unscrews, somewhere near the back of the engine. The dipstick will be a small stick (3-5 cm) on the bottom of the plug. On a saildrive engine the oil is particularly important as seawater can enter and cause emulsification of the gearbox oil. If the oil is of a creamy consistency there is a problem.

Belt - The alternator rubber belt drives the alternator which generates electricity to charge the batteries, and also drives the sea water cooling impeller (pump). Broken belt = no power and no cooling water! A damaged belt can also get jammed between fast moving parts and cause a fire.

Check the belt with the engine stopped. If you can twist the belt more than 90 degrees or push it more than 1 cm then it is too loose and could slip. If it is too tight then it will wear more quickly and generate a loud noise. Check for signs of wear and tear (cracks, etc.) on the belt, and if it is too tight or too loose then it needs adjustment by a mechanic or someone who knows what they are doing.

Batteries (not bilges - see Leaks for bilges) - Batteries store electrical power for the many electrical systems on board. At the minimum there is usually one battery for starting the engine, and 2-3 batteries for the rest of the electrical systems on the yacht. Sometimes there will be extra ancillary batteries for the anchor windlass, bow thruster or other large motors.

Batteries are usually of the standard liquid acid type, or sometimes gel. After a season or two of use they can decay and will no longer hold charge. They can become dangerous at this point because they boil and produce dangerous gas when charging.

Check the battery terminals are tight, that the batteries do not get hot when the engine is running, look for any leaks of fluid, and any smell of hydrogen sulphide when they are charging - similar to the smell of rotten eggs. If in doubt turn off engines and shore power and evacuate the yacht.

Batteries are only 12V but they produce Direct Current which is far more dangerous than Alternating Current (mains power on land) even though the voltages are much lower. Never touch positive and negative terminals at the same time and do not tamper with wiring if you do not know what you are doing. Short circuits cause fires!

Battery charge - check voltage

- When charging by engine or shore power should be 13.8 - 14.4V
- When not charging 12.5V+ is good, 12.0-12.5V is OK,
- If less than 12.0V need to charge as this damages the batteries
- If batteries rapidly drop to less than 12.0V, they need to be replaced

Leaks - Look around the engine bilge space for obvious signs of leakage. We need to identify which system is leaking (water, oil or fuel?) - sight and smell are the best ways to identify. The floor of the bilge will usually be white, so that we can see the colour of any leaking fluids. Keep it clean so that you know if any leaks are new.

Exhaust - When the engine is running, check that the seawater exhaust is running correctly. This will be located on the port quarter or starboard quarter of the exterior hull. If seawater is not flowing out then there could be a blockage, which will quickly overheat the engine. Check there is water running out, then check again after one minute.

If there are exhaust fumes coming out, the colour is important:

- White smoke - This is steam evaporating from inside the engine. The engine is very cold and is taking some time to warm up sufficiently. This could also be warning us about a leak in the water system into the combustion system (seawater or fresh water/antifreeze mix)
- Grey/blue smoke - There could be a leak in the oil system into the combustion system.
- Black smoke - There is unburnt fuel in the system. Possible reasons include an air intake blockage, dirty fuel or a fuel system problem (malfunctioning fuel pump or injectors)

Familiarise yourself with the location of the oil filter, fuel filters, emergency stop, and the fuel cutoff valve. The fuel cutoff valve can be useful for manually stopping the engine in an emergency. (normal electrical methods of turning it off are not working, for example)

If there is a fuel supply problem afterwards, you will have some air inside the fuel system. We must get the air out before the engine can be started again. There is a small manual pump which we can press to squeeze the air out. It looks like a black button on the top of the fuel pump or filter. Press this button again and again until you can feel there is no more air inside.