

# How I serviced my Yanmar 1GM10

Jonathan Davies

*Shrimper Merriwinds (847) (2020)*

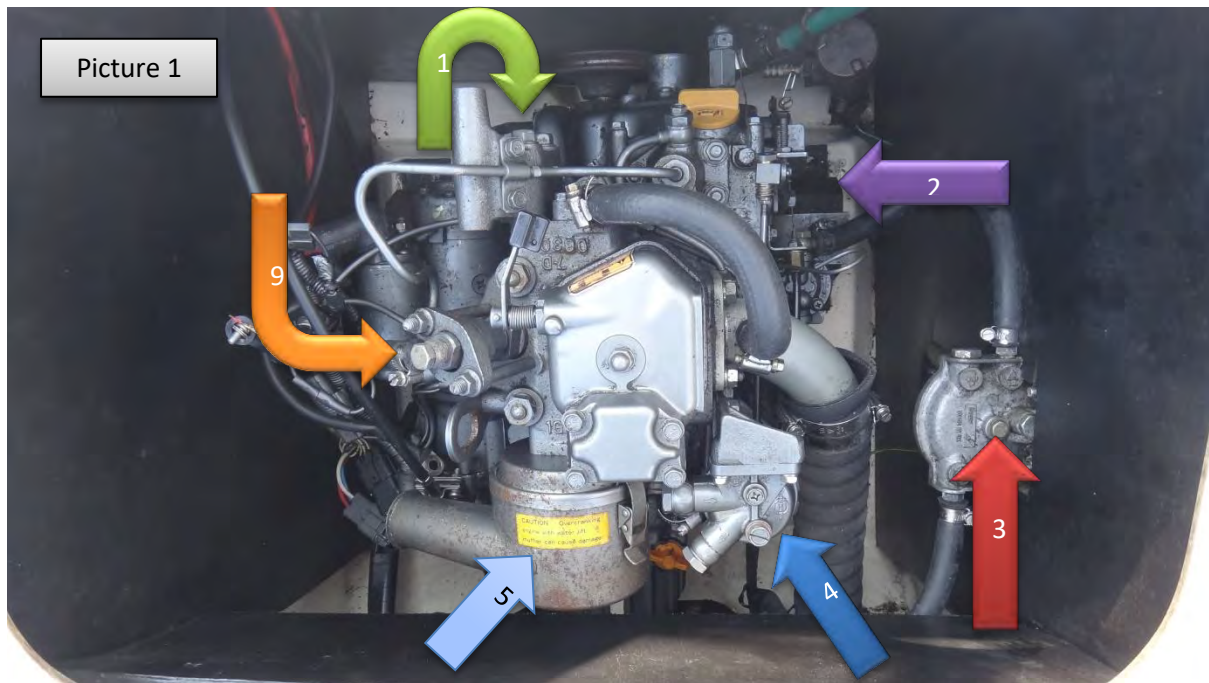
I have previously always had outboards so when we bought a mk2 inboard Shrimper, in comparison with a 5hp Tohatsu, the Yanmar GM10 under the cover looked enormous, extremely complicated and virtually inaccessible. When it needed a service I wasn't at all sure where to start, and the following is the result of a lot of advice from other owners. It is quite possible that there are other ways of doing some of the jobs, but the procedures described worked for me. As the boat was new to us I decided to replace as much as possible, but not everything mentioned here needs to be done every year.

The motor is shoehorned into a small space and access is very limited (although the local Yanmar dealer claims that, with their experience, there is no job on a Shrimper that can't be reached and fixed in situ, even afloat, and that the cockpit floor usually does not need to be removed). To give as much access as possible at the front I first removed the alternator (the pulley was rusty and needed rubbing back and painting in any case). When doing this it is a good idea to peel back the small rubber covers and take a photo of the wiring to make sure everything goes back in the same place. Once the wiring is removed slacken the pivot bolt and the bolts at each end of the support strut underneath, let the alternator slide down and remove the belt. Then remove the top adjustment bolt before carefully unscrewing and removing the long pivot bolt. There is just enough room to pull it out forwards, pushing against the soundproofing. The alternator can then be carefully lifted out. The strut can pivot down out of the way.

Bear in mind that during the course of servicing the motor there is a very good chance of spillage of dirty oil, diesel fuel and water. Be prepared with plenty of rags or paper towel. As it is not possible to drain the sump in the normal way you have use a pump to suck as much dirty oil as possible out through the dipstick hole and into a container. You next have to turn off the fuel at the tap at the front of the tank. As this is not at all obvious you will need to feel around in the tank space to find it (see the photo).

You will then need:

- 1 Oil filter with rubber seal
- 1 inline fuel filter
- 1 anode with gasket
- 1 impeller and cover gasket
- 1 Lucas CAV fuel filter with seals
- Possibly 1 Yanmar air filter



Picture 1 illustrates the location of the relevant components. (The alternator has been removed)

**Green arrow 1** is the dreaded rubber impeller, hidden away at the front of the motor behind the big pulley. Refer to picture 3 for a better view of its location. This description describes a standard set-up but there are modifications available which can make the job easier. The impeller is behind a cover which is held on by three small bolts which are not difficult to remove but easy to drop and lose in the area beneath the motor. In picture 3 you can see the takeaway plastic dish (with some pink antifreeze that drained out of the motor after winter storage) placed underneath to catch anything that falls. The impeller cover comes off easily (some water will gush out), but note which screw hole is top as the cover gets worn over time and the cavity behind it is slightly oval shaped. It needs to be replaced in the same position. Completely remove the old gasket and with a small pair of pliers pull out the star shaped impeller which is pushed onto a shaft with a locating flat. Then inch the motor round by turning the pulley until the flat is at the top. A mirror greatly helps this. The new impeller needs to be compressed smaller than the housing to enable it to be pushed in and this can be done with a jubilee clip or piece of pipe of the right diameter. If the flat is at the top it is easier to locate the impeller on the shaft. The vanes can be either way round; they will sort themselves out once the motor starts to turn (some lubricant is supplied with the Yanmar package but otherwise washing up liquid on the impeller will help here). Although not obvious, the gasket is shaped and must match the ovality of the impeller housing. Lightly wipe the gasket with waterproof grease. Replacement of the cover, although fiddly, is straightforward. As the tiny screws are easy to drop, a plastic tray beneath could avoid some very difficult manoeuvres to recover something from the area under the motor.

**Purple arrow 2** is the oil filter. (See also picture 2). This is a small but conventional can type filter as fitted on cars. It is hidden below and not visible on the photos but quite easy to locate. It unscrews clockwise as viewed from the rear of the motor. It is not supposed to be very tight but might need a small filter strap wrench to remove it. The canister is full of dirty oil and already horizontal so some spillage is very possible but slipping a freezer bag over to catch oil once it has begun to turn will

greatly help, as will a container placed below (but remember this can't be too big as it needs to be lifted out horizontally to avoid spillage). The photo also shows a green hosepipe attached to the water inlet to enable the motor to be run out of the water. It might be necessary to remove the black rubber pipe from the spigot to give enough access to the filter (as shown in the photo). If it isn't already greased lubricate the new rubber gasket with a smear of oil and screw the new canister back on. It doesn't need to be overtight, but check for leaks later when the motor has run for a couple of minutes.

**Red arrow 3** is the Lucas CAV filter housing. Any trapped water in the system will be found in the lower canister (which might be glass or metal). You will see that there is a hidden tap underneath to drain this and remove water without dismantling the filter housing if necessary. Drain the fuel and any water into a tin. Be prepared for a mug-full. (Again space for a container is limited so do a little at a time so that it can be removed without spillage) then, to replace the filter, unscrew the nut in the centre of the housing (arrowed). The filter assembly and lower canister then drop out, together with any remaining fuel, so a container below to catch it is required. The new filter element comes with several rubber gaskets which need to be replaced. There is one important O ring up inside which is difficult to remove. To make sure that everything was properly in place I eventually undid the two bolts holding the whole assembly to the bulkhead and then turned it upside down. Access is then simple.

**Blue arrow 4** is the in-line fuel filter. This is removed by unscrewing the castellated ring (see picture 2). The cup may not drop far enough to clear and the paper element, which is pushed up into the housing and secured with a built-in O ring, may need to be pulled down itself to enable all to come free. If desperate the two bolts holding the housing to the motor block can be removed, enabling the filter housing to be moved upwards a few mm (it is attached to a fairly rigid pipe) to enable the cup and element to be removed. Replacement is obvious.

**Light blue arrow 5** is the air filter, the cover is simply held on with two clips. The element is a very simple removal but be warned; this can look quite clean and unclogged but the foam element itself could be rotten and powdery, eventually allowing chunks of old foam rubber into the air inlet. Rub the foam and if pieces easily break off then this needs replacement. See picture 5 for a bad example.

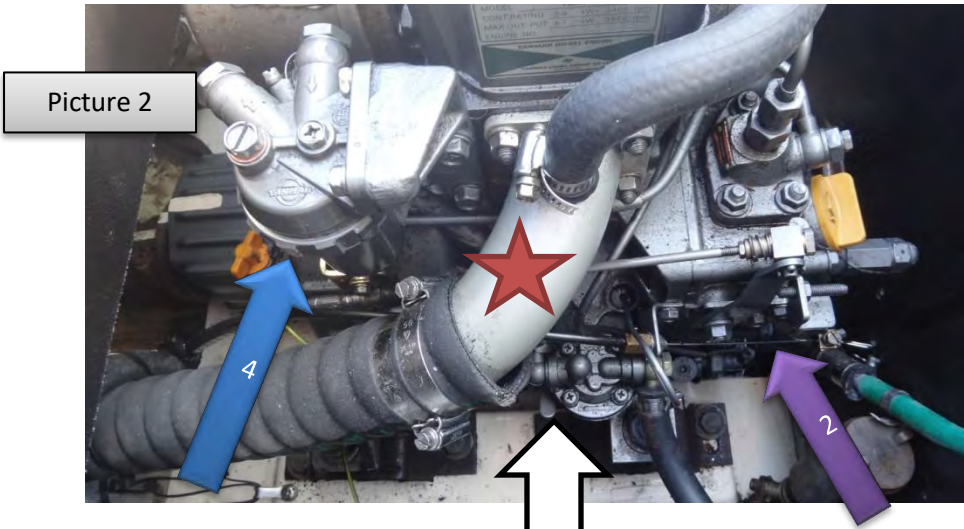
**Orange arrow 6** is the sacrificial anode hidden down under the side of the motor. Picture 4 gives a clearer view. Remove the two outer bolts and the assembly comes free. The centre bolt holds the anode which should have a rubber washer behind it. Lightly wipe the new gasket with waterproof grease before reassembly.

#### **Further Observations:**

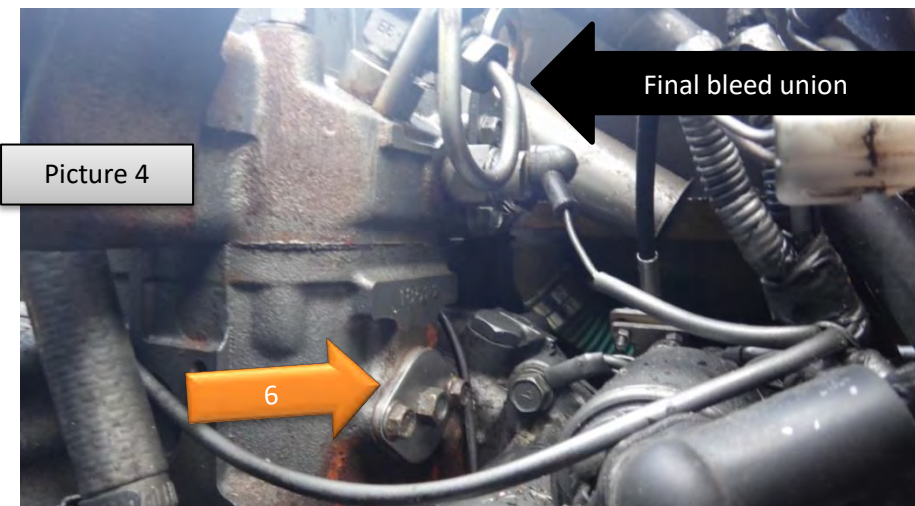
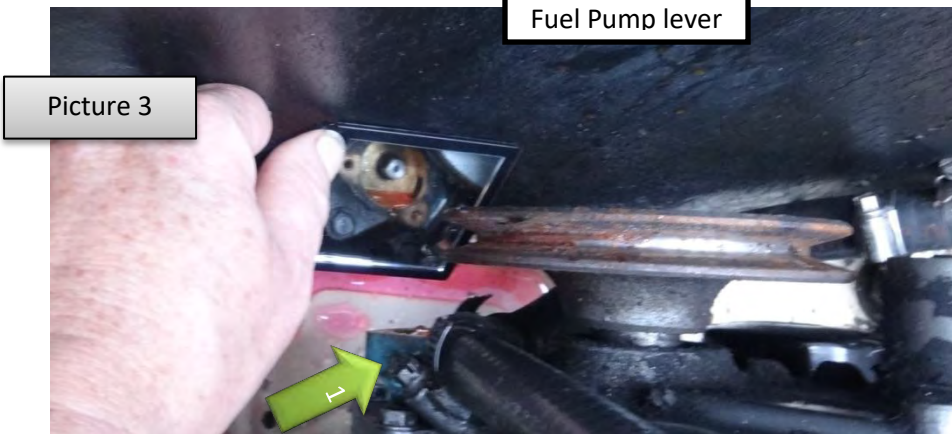
In picture 2 the red star indicates the exhaust elbow which, although looking good on the outside, can corrode inside and be a source of major trouble. Now might be a good time to remove this for examination. There are a number of articles about this on the SOA website.

In picture 3 the bottom pulley can be seen after several months standing idle. It has become quite rusty (in spite of a spray with WD40 on layup) and this rust needs to be removed with emery cloth wrapped around a straight-edge as otherwise the rubber drive belt will quickly become worn by

rubbing against the rust and will constantly be slack. The alternator pulley suffers from the same problem and will also need to be dealt with.



Fuel Pump lever





Picture 5



Picture 6



Once everything has been done the motor will need to be carefully refilled with oil (with frequent reference to the dipstick to avoid overfilling), the fuel tap turned on and the fuel system bled.

If the motor starts easily with no continuous warning lights or buzzers (although the low oil pressure buzzer will continue to sound for some time after the motor has started until the system has circulated the new oil around the motor), and you can see no leaks anywhere while water happily gurgles in spurts from the rear exhaust, then all should be well. Top up the oil when the motor has run for a short while as, once the oil filter cartridge has filled, the level on the dipstick will drop.

## Fuel System

The **fuel tap** is in the rear locker hidden around the corner behind the stern gland greaser. Vertical is on and horizontal is off. (I drew a line on the bulkhead to show its position).



### To bleed all the air from the system:

With the fuel on, slacken the bleed nut (A) at the side on top of the big filter. There will be a wait until the whole assembly fills with fuel. When fuel free of air appears re tighten the nut. Next slacken the screw on the top of the second filter (C). Find the small lever on the low-pressure pump (picture 2 and just visible in the photo at 'B') and pump it until bubble-free fuel appears on top of the filter housing. Re tighten the screw while pumping to ensure no air gets back into the system. If the lever seems to move with little effect it is possible that the motor has stopped in the wrong position. Turn the motor by its front pulley until the pump lever has some pressure. Next turn to the high-pressure pump (D) and slacken the hexagonal nut on the top above the yellow oil filler cap. Again, pump the lever at (B) until air-free fuel appears and tighten again while pumping. The motor should now be ready to start. If it won't, slacken the union on the rigid pipe (see picture 4) directly under the rubber hose at (E) and turn the motor on the starter until air-free fuel appears before re-tightening while turning the motor. The motor should then immediately start.