



CONTESSA 32 CLASS ASSOCIATION TECHNICAL PAPER

REPLACING A PETTER 12HP WITH A NEW BETA 20HP ENGINE



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DOCUMENT INFORMATION

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Original Contributor	Brian Bird – “Genie”
Edited by	George Isted and Colin King
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INTRODUCTION

After spending a number of years thinking about a new engine, we finally went for it last winter. I nearly chose the new 16hp Beta twin on the grounds of size, weight, fuel economy and the fact that I had always been quite happy with the bare 12 hp afforded by the Mini Twin. In the end the price difference was so meagre it was difficult not to opt for the larger, smoother unit.

There are one or two things I wish I had known before I started, for what its worth, here are a few of them. (This is a 1979 boat with original engine, fitted with brown plastic under engine drip tray and bonded in steel engine bearers)

Firstly the engine will fit, even with the high rise exhaust. It is tight though, and I reckon that I have only about 5mm clearance under the cockpit sole. It is possible to remove a small section of the ply stiffener under the cockpit if you need to pinch an extra bit of clearance, and the injection bend could always be doctored a little if necessary.

Next, even when you add the extra engine plates, the engine will not end up too high for the prop, and should be comfortably at the bottom end of the range of adjustment offered by the new feet. I fitted new 5mm plates screwed into the original holes and with three additional 8mm set bolts added each side. I found the steel bearer runs the length of the bed, and is quite wide, so picking it up and tapping it to add the extra bolts was no problem.

OUT WITH THE OLD....

A few years ago we fitted a new propshaft. so removing the rudder and prop was easy, if you have not done this before, Jeremy Rogers has some notes on the method (see also separate article on the Website). I have seen it written that the boat needs to be lifted in order to remove the rudder, this in not so, the clearance is fine. Note that the shaft seal, engine coupling, stern tube bearing and prop shaft have all got to match; either 1" or 25mm.

Removing the old engine proved easy and I managed it singlehanded even swinging it out on the boom and putting it onto a pallet. I was not so brave with the new motor and paid for a yard lift. Incidentally, the old engine sold quickly via the local paper for 400 quid. I advertised it in the summer so the new owner could see it running.

.... AND IN WITH THE NEW

The new unit needs a clear 3/4" (19mm) water supply, which is a pity because I had recently fitted a new Stuart Turner combined seacock /strainer. This is a very neat unit but hopelessly small, so had to be changed. I ordered the Beta water supply kit which was a mistake (Fig 1). The strainer is a huge bronze casting which is designed to fit directly onto the hull skin fitting (supplied); this may work on a whaling vessel but few pleasure boats will have the space. Fitting it remotely means you have to consider how to fix it (no mounting lugs) and what you would do if the pipe between the seacock and the strainer became blocked. The spiral wound black tubing supplied is nice and flexible but a devil to fit over the spigots, it will "screw" on but be impossible to remove at sea without cutting. It can be made to fit by heating and repeatedly molesting the ends with an

oversize mandrel. I also filed off most of the barb on the hose tails, bearing in mind I may want to remove the tube quickly to free that blockage. Next year I will fit see through woven reinforced hose.



Figure 1 – Strainer & Gate Valve for Cooling Water Inlet

The Gate Valve was later replaced by a Quarter-Turn ball valve (Note the female fitting stepping down the dia of the strainer outlet)

Because you are remotely fitting the strainer you will need an additional hose tail, these are difficult to find in 1" BSP to 19mm ID; and I had to find a female fitting to step down the diameter. The mounting height of the strainer is important, ideally static sea level should come maybe two thirds up the unit. I settled for less than this as it is quite difficult to find the perfect space in the front of the engine bay. Finally the gate valve to the skin fitting was not to my liking, and I bought a ball valve to replace it, which has a much quicker action. Even if you know the difference between Brass ATD, DZR, Gunmetal and Bronze it is difficult to pin chandlers down. I now have a mixture of joints and iffy materials more suited to a steam laundry. Later I will fit a 1 1/2" Blakes seacock and have done with at least part of it. If you wish to source a bronze strainer and fittings yourself, ASAP Supplies stock them. I am sure many will prefer to fit the plastic or stainless steel Vetus alternatives.

The fuel supply and leak off for the Petter are 6mm but the nominal requirement for the new engine is 8mm. I could not face draining the fuel tank after doing it last winter so I kept both, stepping them up to 8mm. Beta were reasonably happy with the bleed off, but more guarded about the supply. I have found much larger engines using 6mm so I am happy, and have not noticed any problem so far.

You need to think carefully on the size of the engine plates, and making a card template is a great help. I think ours were 2ft x 4 1/4" (see sketch). When I mounted them I got fixated with the need to have plenty of overlap onto the existing bearers, this led me to end up with the plates too far apart. I still can't pin down how I managed to cock up the elementary sums but I did. (Fig 2) It was simply fixed by having a pair of lugs Tig

welded on. Most owners of normal intelligence will not have this problem, though they may like to add an extra 1/4" to the width.



Figure 2 - Beta 20 Engine with Filter & Cooling Water Inlet (with Quarter Turn Ballvalve) The strainer was lowered later to bring up the static waterline.

I'm not sure why I decided to use stainless for the plates, surely even Swan don't do that? However it is easy enough to work, but drilling needs a pillar drill on its slowest speed. Always use the best branded bits (Intal, Dormer, Presto etc) use plenty of lubricant, and apply steady firm pressure. If the work overheats it will harden and cause real problems. You might consider mild steel a more sensible alternative, either painted or galvanised.

With your plates made you can fix them down on the engine bed and lower/manhandle the engine into position. This is a nice moment because for the first time you see the engine in its final resting place. Check its alignment, and then mark out the holes for the engine mounts. If you wind up the engine on it's feet you can then drop it onto stout blocks of wood, allowing the plates to be removed for drilling. This saves taking the engine right out again, which is often suggested.

I ordered the basic electrical panel so it could be fitted in the starboard cockpit cubby hole, where it is protected from spray and pleasingly to hand. The problem of a rev counter was solved by a Tiny Tach fitted in the engine bay [1]. This measures the pulses from the injection pump and has its own 9 volt battery; so is very simple to fit. The battery power leads fitted neatly, with no modification. All other electrical connections are on a single harness – dead easy.

The engine controls and Teleflex cables were retained but there was a lot of hokey-cokey in finding the best runs. The action worked in reverse though and the control box geometry has to be turned 180deg; this is quite easy after you give it a good looking at. Do not panic when the gears seem reluctant to engage. I was particularly worried by reverse, but in operation, with the engine running, it went in as smooth as silk; with none of the clunking I associated with the old gearbox.

Most of the exhaust system needed little work and there is a near vertical fall from the injection bend to the water trap. I also fitted a siphon break between the water outlet and injection bend, it fits neatly on the forward face of the bridgedeck; securing it with a turnbuckle allows easy access for maintenance, as long as you leave the piping suitably over length. This type of valve can fail to operate if bunged up with salt. Leaving a long PVC tube from the vent means you can blow down it now and again and reassure yourself that it is operating properly [2]. There is no swan neck on the transom outlet, though the pipe itself does angle down quite nicely, I have had no problems with seas entering the exhaust but I suppose it could happen. There is a rather inaccessible cock which could be used in heavy following seas. Take care, the previous owner closed it with the Petter, and then forgot, blowing the head gaskets as he started the engine.

Lining up the engine with the flexible drive is a matter of guesswork. I settled for it when it looked right and the studs from the drive engaged cleanly in to the gearbox drive. A short length of shaft (say 8") gripped in the Centaflex collet allows you to do the initial lining up, using a 6" rule as a straight edge making it easy to check the up/down, side/side and angle of the engine. If you have a conventional plate you can use feelers in the usual way. One good tip I picked up from Joe Timbs on the website: to centre the prop shaft in the stern tube insert a roll of insulation tape (with an i/d of 1" which can be packed out if needs be) onto the shaft, unrolling the tape till it is a snug fit in the stern tube (Fig 3); of course you can use an old stern bearing if you have one. This has to be done, because without support, the shaft is just flopping about on the aft bearing.



Figure 3 - PSS Shaft Seal & Centaflex Gearbox/Shaft Coupling. Note roll of red tape just visible in stern tube. With this set up you can put a short length (say 150mm) of bar into the coupling to align things with a steel rule across the two

The advice is often given to check engine alignment when afloat but I can't see how this is possible, I was relieved when a marine engineer told me he felt this was unnecessary on a GRP boat.

For stern gear considerations I consulted an expert. He cast the chicken bones and decided the existing 13" x 10 1/2" prop might hold down maximum revs to 3,200 or 3,300, but would be adequate. Quite how the same gear can suit a 12hp *and* 20 hp unit; and why it should hold down the revs rather than letting it race away, I have no idea. I will use the current prop for a season or two and then perhaps upgrade to one exactly suited to the new engine. I was not attracted by the smart folding props available and kept things as they are: 2 blade, solid.

People quote yard costs, for engine fitting, of £500 to over £2000. But even with a lottery win I would have done it myself. Partly because I have the time but mainly because of the insight it gives. The work I feared most; taking out the old unit, hoisting, engine plates, and electrics proved easy, perhaps because I had given it some thought. Do not underestimate the ancillaries which can be surprisingly time consuming and frustrating, particularly if you are a distance away from a well stocked chandlers. You may also spend more time than you imagine making good with small GRP work, bilge painting, refitting insulation and sorting out the old, and new, engine panel all on the agenda.

Beta offer a good product at a fair price, and I have found them very helpful. You may consider the 70 amp alternator useful for £190. The standard 40 amp unit has proved excellent however, I never realized how white the cabin lights could be with a fully charged battery. Even if you stick with the standard alternator I strongly suggest you order the Poly Vee belt upgrade which is available for about £90; it eliminates problems of belt wear and slippage. I have used the Centaflex coupling and PSS shaft seal for two seasons and would recommend them both. The shaft seal has not let a drop of water into the boat and eliminates grease and adjustment problems. The cushion drive Centaflex does not eliminate alignment problems but the need for accuracy is reduced.

I offer the above in good faith but you must make your own choices, each boat and each owner will differ. In particular the Petter and Hurth gearbox combination can vary leading to different prop heights, measure carefully and weigh up the pros and cons of each decision and you should be OK.

SUPPLIERS AND ADDITIONAL INFORMATION

[1] Available from: I.T.C.O. 37 Coronation Rd, East Grinstead, West Sussex. RH19 4AJ Tel 01342 305114.
Details on the Web.

[2] Vetus do an expensive model. Force 4 Chandlery supply a similar thing for £13 + p&p, it leaked a bit at first and then settled down.

If you would like any additional information about how to proceed with upgrades or repairs to your Contessa 32 an excellent forum is available on the Association website where you can post questions and draw on the collective knowledge of many owners.

Contessa 32 owners are in the very lucky position to be able to contact the original and current manufacturer of Contessa yachts, the team at Jeremy Rogers Yachts are extremely helpful and will offer free advice to owners as well as historical information about your particular Contessa. Jeremy Rogers Yachts can provide a range of spare parts and will carry out repairs both small and large, their contact details can be found on the Jeremy Rogers website.

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