Swallow Bayraider Expedition and Epropulsion Spirit Plus XS - a Marriage Made in Heaven?

This lockdown year 'The Great Pause' is our 5th with our BRe Whimbrel 047 down at Redclyffe Yacht Club at the extreme western corner of Poole Harbour.

We'd been racing and rallying Wayfarer dinghies for some 36 years, getting heavily involved with that class's organisation and entering many, many championships and cruising rallies over that time. These included Denmark several times, Friesland several times, Falmouth several times, the West Coast of Scotland, Loch Lomond and many venues around the East Coast of England. Our first rally with our children was at Pénestin and the Morbihan in Brittany – we borrowed an outboard for the first time - and vowed never to use it! We never took an outboard after that although very occasionally we took a tow in exchange for a pint, maybe to get under a bridge in a Dutch canal for example. Once in Holland on the massive Princes Margriet canal, which you are not allowed to cross using sail, the outboard motor on the towboat failed and we ended up paddling furiously away from a rocky bank.

But eventually in 2015 it was time for a change – we tested a BRe down at Northney – conditions were perfect, bright sun and a light shifty breeze – we were hooked, this seemed the ideal Poole Harbour boat, with its wide shallow waters but narrow channels. Our new club Redclyffe YC was 2nm up the narrow windy, but picturesque River Frome from where we could normally raise our sails at the start of the Wareham Channel. Of course we needed an engine! I have to say the Mariner 6 has been 100% reliable- it has never let us down, although you have to understand its temperament – is it hot or cold, does it need choke, if so how much , how long? Should I use the fuel from the internal tank or the external tank, is there maybe water in the fuel, and then all the debate about the addition of biofuels causing possible problems or not? Do I need to change the spark plug or not and the annual service under warranty is inconvenient and expensive. Very early on we thought we could make a close fetch along a narrow channel but the wind petered out a bit and by the time I got the engine started we were drifting into the derelict ribs of a sunken vessel. These events made me more cautious – we start the engine too early and take the sails down too early, when really there is more sailing to be done, we just need to be able to reliably shoot the narrow bits. Shrimpers seem to do it OK; they happily run down the narrow bits and squeeze around into narrow windward channels with impunity. How do they do that I wondered? Of course their secret weapon is their little inboard engine with electric start, probably one of the secrets of the success of that class.

A BRe can run rings around a Shrimper but the engine issue needs sorting – at least in my view – what is required is ***POWER ON DEMAND***.

What to do? There has been much discussion of electric motors on the forum and all the limitations examined. Ian Thompson of Nestaway Boats Christchurch offered a two hour test of the relatively new Epropulsion Spirit XS 1018Wh last October 2019 which I reported on the forum on the thread 'A Horse for our Course?.' Our main requirement was first to find out if the engine would fit in the boat and then to find out if there would be any battery left after a 2nm trip to the start of the Wareham Channel where we normally put our sails up and of course the 2nm trip back! Of course, as reported, it fitted, it worked very well and we were left with 50% remaining battery capacity – this was looking good.

Fast forward to late April, our new engine arrives now with an extra 25% battery capacity 1276Wh – the Spirit XS PLUS!

Unpacking

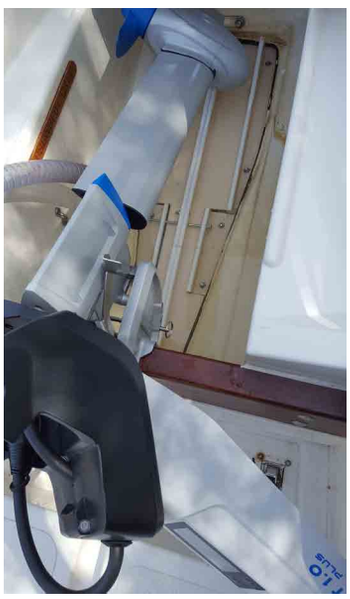
But we and the boat are in lockdown – I set up the engine on a lath clamped to my workmate. This turns out to be a useful thing to do as the engine is a bit of a contortionist and it's handy to find out how it folds outside the confines of a cockpit.

As supplied, the prop shaft is rotated 180 degrees from straight ahead and the tiller arm folded right down parallel to the shaft, which is the compact form for carrying and also how it fits into the carry (guitar) bag I'd also ordered. It goes nicely onto the back seat of a car and also fits easily into a BRe cockpit locker.

The optional battery bag has a carry handle and rucksack type straps. Both bags have handy side pockets. This was also the time to try fitting the battery and testing the operation. The battery is very easy to fit and has a strong latching system. The manual was easy to follow and the display very clear with only a 'power on' and a 'select' push button. Of course there is a simple twist grip control – no gears or clutch on this! As supplied the battery was 60% charged which is its correct default state for storage over the winter too. Interestingly, you can calibrate the twist grip for clockwise or anticlockwise rotation for forward and reverse and even the neutral position can be amended – possibly to allow more rotation for forward and less for reverse but I haven't tried that. Unlike with petrol motors, there are error codes to tell you how the motor is feeling! So once, the battery cable wasn't in properly and I instantly got a low voltage message. The battery connectors are robust looking metal connectors with locking rings. The display has a very clear 10 segment circular display to show the battery charge. The main numeric displays show the current wattage selected from the twist grip and the consequent battery duration you are likely to get. To run the motor, power has to be on (!) and the magnetic kill cord has to be in place. A quick try in the garage confirmed the prop rotated almost silently forward and backwards with the twist grip – all looked good!

The Fit

Over the winter I had been wondering about the lamellae and that big two bladed prop and the overall fit in general so I took the motor down to the yard to sort this out. The prop went down through the lamellae like a knife through butter – but as discussed on the forum, the lamellae would normally knock the prop flat as it was being raised, and it is wider than the opening in that position. It is said on the forum that you just need to poke a stick down through the lamellae to prod the prop into a vertical position – that worked but I couldn't see how that would work in general when you couldn't see the prop. I was also concerned that the sharpness of the edges of the lamellae would possibly scratch the coating of the aluminium alloy shaft – this motor was more like precision engineering than garden machinery. I put my hand through the lamellae and immediately cut my fingers – so don't try this! Replacing the lamellae with a cover plate is much discussed on the forum but most solutions go the 'Full Monty', removing the whole lot. I had another idea - to create a keyhole shaped cut-out and hatch cover just big enough for raising and lowering the motor. This turned out to work just fine and I discuss this in another write-up!



But how was the overall fit? Well the skeg of the XS cleared the back of the engine well by an inch while being raised and the engine locked up into a 75 degree position with plenty of clearance for the prop. To achieve this, the engine's quite large tiller rotates upwards with the twist grip located in the drainage run through the centre of the BRe's floor. The back of the battery then sticks up but is still well under the boat's tiller. A far better solution though is to rotate the engine sideways so that the engine's tiller fits into the port fender bay which allows it an inch or two of clearance

and also means that the back of the battery is well down and out of the way of any rigging, tiller ropes etc. This position also gives easy presentation of the control lever for raising and lowering the motor.

The prop shaft itself is quite broad but slim in section but as said before is able to rotate through 360 degrees. Fortunately the round section at the front of the engine well is able to cope with the space needed. So all in all the engine fits well, it would be too big if much larger in any dimension. It almost seems it was designed to fit a BRe!

The Launch

First thing was to launch Whimbrel down the short slipway at Ridge Wharf and onto the pontoon there. We were followed in by a speedboat with cacophonous engine. Their crew watched in disbelief as we creamed past the finger berths in absolute silence on 50 watts. We headed upstream the half mile to the Redclyffe Yacht Club pontoon to pick up our dinghy. Again amazement as we arrive in silence! Then forward a short way onwards to our fore-and-aft trot mooring. The Cetis Warbler announced our arrival!

At Last - The Test!

We'd used hardly any power but I charged up overnight ready for the big test. I thought we'd take it gingerly as we headed down the River Frome in not much current and gloriously sunny and breezy easterly wind conditions typical of the lockdown. But first we had to get off our mooring. Normally, we go slightly into reverse and the prop wash brings our stern in and the bow out so that we can clear the boat in front. I thought I'd try the same with this motor especially as the strong easterly breeze was blowing us into the adjacent reeds and willow. It turned out the prop wash effect was the same which was good. However with a slight miscommunication with my crew, the pick-up line wasn't released and the bow immediately swung back into the shore again. So this time with a gentle flick

of the wrist we reversed out and then forward into the river. We then had to make a 180 degree turn. This engine turns a full 90 degrees - further if wished, but then it gets confusing! So we did our tightest ever turn. To get out to the harbour, the 2 nm of River Frome meanders all over the place; there are times when we head back towards Wareham Church from where we are supposed to be escaping from! We are on just 200W, a fifth of the power - there is a four knot speed limit in the river. Navionics tells us we are mostly doing 3 knots, but 2.8 or 2.9 knots where there is a headwind and sometimes 3.2 knots in the tailwind sections. We filled the ballast tank and it seemed to make no difference to the speed. The display tells us we can keep this up for some six and a half hours! It's going to be a close starboard fetch up the two mile Wareham Channel and we cut back the engine to 100W as we veer across the channel to get the sails up. Oops, 100W is too much - we're heading into the shallows. We ease out into the channel again and then

back upwind on just 50W which gives us time to set sail. Now with engine off we are creaming up the channel with one reef in. Once in the main harbour we shake out the reef and have a four mile dead beat up to the harbour entrance. As we approach Brownsea Castle the tide turns more strongly against us and we start to make slower progress – we could be running out of time. Normally with the old engine, rather than starting it, we would consider running back the way we came. But hey, this is a test - let's try something! We give the motor just 100W and what a revelation! It gives us just that kick to nullify the tide – we maybe only have it on for 5 minutes. We passed Brownsea Castle 'Solent Rigged' and then shut down the motor as we picked up the flood and tail wind and headed back west into Blood Alley – on the gloriously picturesque south side of Brownsea. We at last try out our engine well hatch cover – it works beautifully, no turbulence at all - better than the lamellae I think.

Now we have a beautiful four mile run back to the Wareham Channel and from there in a dying breeze we have a close reach back into the Frome. Now rather than starting the engine in good time and taking our sails down as we would normally do with the petrol engine, we leave it as late as possible entering the Frome and we keep all sail up – unprecedented for us! The Frome is now in spate against us and we have 2nm trip back to our mooring. We are on 200W to 400W making good speed, sometimes the sails are giving us a boost too; this certainly adds a new interest to the trip back. A bit later on we are spotted by a friend from Ridge Wharf who subsequently asks if we enjoyed our trip in the 'Mosquito?' "Mosquito?" I reply, "Were we making so much noise?", to which he responds, " You were absolutely quiet,

making no noise at all and what's more making no wake at all". As he alluded, I think "Mosquito" would be a good name for a BRe. Then for some reason a couple in a Canadian Canoe thought it would be fun to stay ahead of us – they were paddling like mad, presumably their lockdown exercise – they kept it up all the way back as we toyed with 300-400 watts to keep the pressure on!

When we got back we still had 60% battery power remaining having gone some 19nm in five and a half hours with 4.5nm under power. That should give us approaching 11nm engine range by not caning it. Flat out at 5.5 to 6 knots would give us a range of 6.8 miles which would still be a good enough range for us most of the time. But hey, if we want to cane it we should get a speedboat. Or maybe get a spare battery which could go in the locker where the external fuel tank normally sits!

Solar/ 12v Battery Charging Lead

Ordered but not yet delivered is a charging lead which contains a 12v step up to charge the 48v battery. Requiring no controllers it can connect directly to solar panels or the ship's main battery to give a bit of a boost in the background which could help a little bit to maintain levels.

Conclusion

The eye-opener for me is the ease of power "on demand" and the smooth transition from sail to power or vice-versa or to run 'Solent Rigged' with maybe with just 50, 100 or 200 watts. There isn't the big fundamental transition of flying elbows and noise and uncertainty as there is with a petrol motor and it actually enables us to keep our sails up much longer in narrow passages and opens up more routing options.

Whimbrel at a Falmouth Raid

We mentioned quietness a few times, but we haven't mentioned lack of petrol smell, lack of polluting the harbour, lack of vibration, lack of much servicing, really just contact cleaner every few months, easy of getting it in and out of the boat (two 8kg sections), lack of fuel pipe dragging, lack of external fuel tank, no spark plugs to change, the list goes on.

This is also rather importantly a motor that my crew could operate.

The one caveat is the issue of the lamellae and it is a personal choice as to whether to remove them or not but my keyhole prototype worked well and I would hope that a production version would eventually be sorted – who knows!

The BRe has been a great boat for us, great looking, not a floating caravan, but with a nice sheerline, a jaunty cabin and a great performance. But small boats like this have been the poor relation when it comes to engines for a long time. Anything bigger can have a smooth twin cylinder with electric starter. Now the role is reversed, we are now ahead of the game, and at last we have an engine which fully complements all the qualities of the BRe.

Ray Scragg BRe 047 Whimbrel