

The “Brown Mk1” CNC Milling Machine – Mike Brown

As some of you will know last year I made myself a small CNC Lathe - to be more accurate I bought a small lathe and retro fitted it for CNC. (Those of you that come to the winter lectures regularly will remember me demonstrating how to use a CNC lathe to fling a billet of brass out of the chuck and across the room!) Well despite a few niggles, it has been very successful, particularly for the mass production of injectors and valve bits and bobs of all sorts. The main problem is that once I have programmed it for a part, say a valve body, it seems a shame to make only one, and before I know it I have boxes and boxes of spares and a huge bill for hex brass bar!

Because of this success, I decided that the time was right to go for a companion milling machine. This could run alongside my Hunslett as a building project so that if I was stuck with one, I could get on with the other. Of course logic eventually kicked in and I worked out that it would be very useful to have a CNC mill to help machine bits for the Hunslett. So, the Hunslett is on hold while the CNC mill hopefully progresses.

The first problem was to choose a donor milling machine. After some trawling around I settled on a SPG 9525

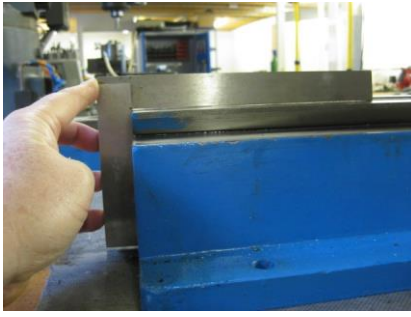


SPG 9525

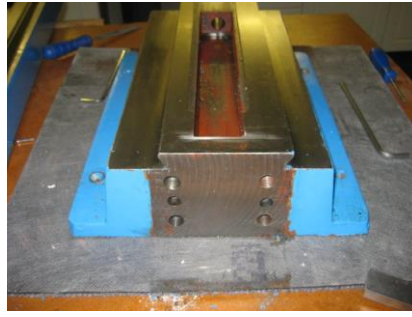
This machine was similar in construction to those from a number of suppliers but it had a bigger machining envelope of X 550mm, Y 200mm, Z 400mm, and an R8 taper (handy as I already have a lot of R8 tooling). Also, the machine was available at a good price, so I bought it.

Delivery was rather fraught as the driver arrived in a 7 1/2 tonne lorry and decided to head down our very narrow overgrown lane as if it were the A55. Normally vehicles of this size are no problem, but in this case he managed to lose a wing mirror and damage some cab panels before he reached me – he was not in a good mood! So I now had a large very heavy wooden box sitting slap bang in the middle of the road, inviting me to get it down my 1 in 4 drive ASAP before some traffic turned up - isn't life entertaining? Still, an engine crane, a transit van and much cursing finally saw it into the workshop.

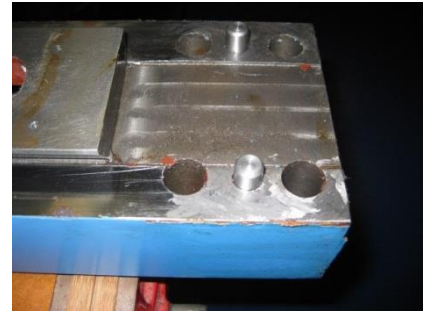
Unfortunately I then showed as much patience as the lorry driver and proceeded to do a nut and bolt stripdown, putting to one side all the bits to be replaced (anyone looking for some good lead screws, machine handles, etc?). I was down to the two main castings, the base and the column, when it occurred to me to check their squareness. Out came the large square, and then out came a cold sweat! The column was miles out, not just a few thou, but about 2mm (3/32nd) along the length of the blade. After much checking of the square I concluded that it must really be that bad and separated the column from the base to see what the problem was.



The accuracy of machining of the base



The poor finish



The bodge on the end of the column

It was soon clear that the cause of the problem was primarily the machining of the base casting - not only was it out by a mile, the machined finish was also pretty poor. In addition, someone had attempted to “cure” the problem by having a go at the locating face at the bottom of the column with some sort of grinding tool. I now had a dilemma, torn between three options, return the machine and ask for my money back, have it replaced, or ask for it to be fixed. Well, it was just the size I wanted, I could not find an exact equivalent from another supplier, I knew that there were no others available until the next shipment from China (and I had already waited weeks for this one) and I did not trust the supplier to “fix” it to my satisfaction. So in the end I decided to go for a fourth option, fix it myself. These are pretty big castings so machining them was going to be a challenge. As it happens I have a fairly large shaper machine that I bought on a whim about fifteen years ago and have never really found a use for - today was going to be its day! After much fiddling about with a clock gauge and needing two pairs of hands rather than just one, the base was finally accurately mounted onto the shaper box and machining proceeded straightforwardly. Next the column was mounted on the milling machine with a similar amount of faffing around and again machining proceeded with no problems. However, on reassembling, the column and base were still not square, not by the huge amounts before but still too much. Now I really had to scratch my head - I had been so careful in setting up, I could not believe I had got it wrong. Eventually the penny dropped. When I had mounted the base onto the shaper I had located the top (ground) face of the casting against the table. I had assumed that its face was parallel with the bed faces, no such luck. On checking these faces were definitely not parallel. I now had to remount the base but located on parallels (see below). (This was a job I needed three pairs of hands for!)



The base mounted on the shaper



The column mounted on the mill



Machining the base for the second time!

Having re-machined the base again and re-assembled - success. Now I could not get a feeler gauge between any part of the blade and the column. I have since acquired a larger square and still cannot detect any gap. My only problem now is that the holes for the two taper dowels locating the column are stepped, and so are of no use. I am not sure if they really add to the stability of the column, or if they are just there for ease of assembly. I am now undecided as to whether to leave the dowels out, or to try and make new pins and a reamer and re-machine them. Perhaps more knowledgeable members might have a view on this?



The column now accurately located

So I am now relatively happy, but I am extremely wary of Chinese machines. In many cases they are very well made (I have never had a problem before). The machining is usually to a very high standard as they often use high quality CNC machines. What seems to go wrong is the human element. The machining in this case was probably inaccurate due to the casting not being located properly in the machine. Somebody had noticed, tried to correct it, failed, but still let it pass. So while I still think Chinese machines are great value for money, I will be a lot more rigorous checking anything I buy in future.

As a postscript, I did mention this problem to the supplier when I saw him at Harrogate. He did seem genuinely concerned and said that he would have gladly picked it up and put it right himself. However I am still glad I did it myself.

You may have noticed from the Committee Contacts section that Keith France has taken over from Phil Roberts as Website Developer. Kieth has sent me details of the new look site just before publication, and I have squeezed them in at the end of the newsletter. Phil has doe a great job with the website for many years, and I would like to thank him, both personally, and on behalf of the club for his efforts. Please make the effort to look at the new site, I think that you will find it well worth it