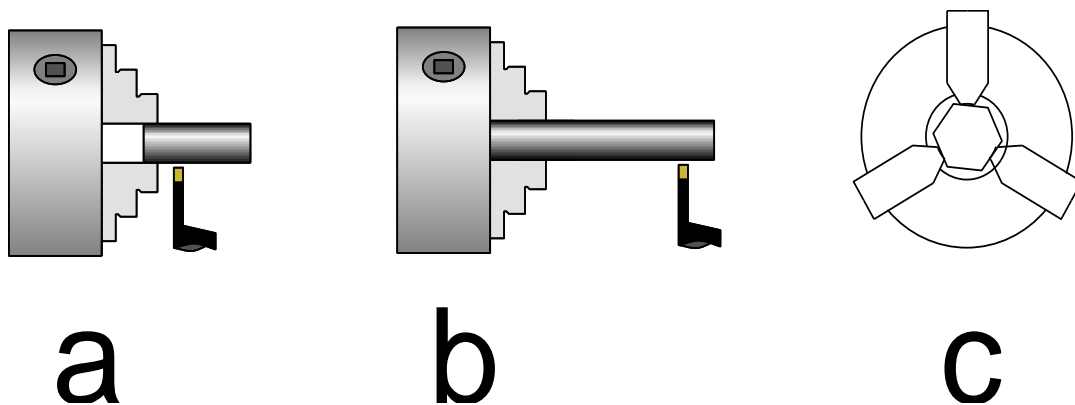


## Carbide Parting Tools for a Small Lathe - Mike Brown

I recently damaged my carbide tipped parting tool on my Emco 3 ½” lathe. As usual it was my own stupid fault, will I ever learn? – probably not! Anyway I thought I would look for a replacement, and it got me thinking about parting off in small scale.

I have been using tipped parting tools for as long as I can remember now on both my large Colchester lathe and my small Emco. In all this time I cannot remember wearing out a tip, although I have broken quite a few! When things are going well carbide tipped tools solve virtually all the problems associated with parting off. If I set things up correctly I never have a problem with digging in of the tool tip and can confidently part off up to 30 or 40 mm dia. (sorry 1 ¼” to 1 ½”), on my Emco with no problems at all. On my Colchester a couple of months ago I parted off 400 16mm silver steel rods both ends using one tip with no problems (apart from boredom).

I did say, however, that I have broken quite a few tips, and at around £4 - 5 a tip that isn't much fun. All the problems I have with broken tips are completely my own fault based almost entirely on impatience and carelessness. Most of these problems are the usual culprits shown below.



My worst offence is holding the work too close to the end of the jaws (fig a). I know it is bad for the chuck and it is almost always going to end in tears, but it is so tempting when I just need to take a few millimetres off the end of a bolt. (Of course, holding on a thread is even worse as there is little contact area to support the work). My other common temptation is to try to part off when too far out from the chuck, again I know I shouldn't do it but I'm always sure that I can get away with it just this once! Another thing that sometimes catches me out is holding hex bar in the three jaw, occasionally the jaws catch on their corners rather than their faces (fig c). Everything feels tight, but the bar comes loose when turning, leading to all sorts of mayhem. I know that there are other dodgy things I try to get away with such as holding the work too loosely when trying not to mark the surface. As I said these are all avoidable problems - if only I were more patient.

Anyway back to my damaged tool, for the last couple of years I have been using two parting tools for on my Emco, see below.



The tool on the left is an Interstate Mini-Thin grooving and cut-off tool from MSC J&L Industrial. This has a double ended blade with “grooving and cut-off” tips ranging from 1mm to 2mm in width with a cutting depth of 6mm (parts off 12mm). There are also “grooving” inserts in a range of sizes down to 0.5mm width.

However, the latter has a depth of cut of only 2.5mm (cuts off 5mm). I have some 1mm tips and some 0.5mm tips. These tools cut superbly and are great for small (even tiny) jobs. The limitations are the small depth of cut and the tip price of over £10 each (although there are two cutting edges per tip!).

For larger diameters I used to use the tool on the left, a pretty standard one piece parting tool holder with a 2.2mm tip (above right). Unfortunately this is the tool I damaged (normally just the tip breaks but this time I excelled myself and managed to bend the end of the tool as well!). I decided that it was time to look for a replacement. One thing is clear, in general the less metal you can remove when parting the less is the strain on the tool and the machine, so as narrow a tool as possible was my priority. I could not easily find a one piece tool holder of less than 2.2mm, but most manufacturers seem to be pushing blade type holders nowadays. I have used a 3.2mm blade and holder on my Colchester machine for a couple of years now and it has been absolutely brilliant (see below).



I found a similar 1.6mm (in fact the tips I have are actually 1.5mm) blade in the MSC/J&L catalogue, no problem. Well actually there was a problem, the blade is currently £49.58, and the holder was £102.71, plus £5.45 for the tips, all plus VAT (pause to get breath back!). However I remembered seeing a blade type tool adapted to fit a standard tool post sold by Greenwood Tools (KIT-Q-CUT at about £50 including one tip, extra tips £8.37 each). This used a 2.6mm blade, but the idea was good so I ordered just the blade and a tip from MSC/J&L. As soon as it arrived I had a hacksaw to it and cut it in half. Then a few minutes on the milling machine had a couple of counter sunk holes in each half. As it happened I had a blank tool holder left over from when I made some extra tool holders a few years ago. Again a few minutes drilling and tapping some holes, plenty of loctite retainer and my new tool was ready (below left). I then fitted the other end to a piece of 12mm square bar for use in my small CNC lathe (below right). So then, two tools for the price of one, not bad.



Now the proof of the pudding is in the cutting and fortunately the new tools work a treat. The cutting depth is 19mm (3/4") so I can now confidently part off up to 38mm (1 1/2"), even on my small low powered machines. One thing you do have to remember when using most carbide tooling is that the tools are not very sharp and require a reasonable force to cut. If the tool is not cutting it can rub, this can lead to vibration which is the worst thing for damaging tips. Ideally power feed is the way to go if possible, although manual will be just fine as long as you have the confidence to go for it. When doing deep parting lack of coolant is not too much of a problem, but some lubrication can help especially when using aluminium. I sometimes give occasional quick sprays of aerosol cutting lubricant to help out.

It is a commitment to use carbide tooling for parting off (especially financial) but once you have used them there is no going back as they just work so well. Things will be even better if you are more patient and methodical than I am.

