WUNDERCUTT 10 MANUAL

The Wundercutt10 is an all purpose tool designed to be able to complete cutting operations of a project from start to finish.

BY ***MUNRO TOOLS LTD NZ***

PARTS:

SCREWS:

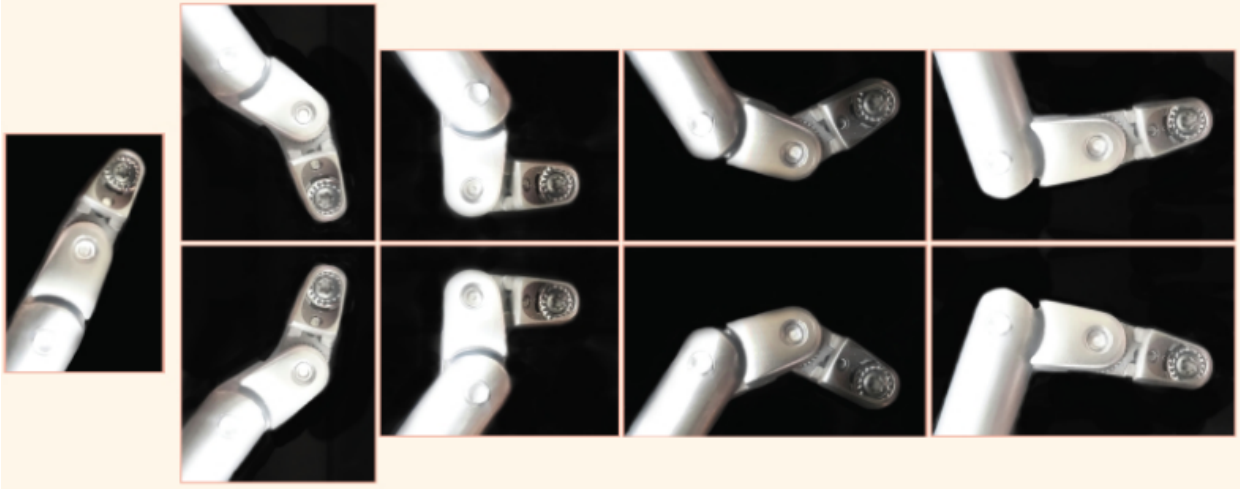
SHAFT TO LINK -
M6 X 12MM - CAP M5

LINK TO CUTTERBASE -
M5 X 10MM - CAP M4

CUTTERBASE TO DEPTH GAUGE -
M3X6MM - CAP M2.5

CUTTER SCREW -
SPECIAL M3.5 X6MM

CUTTERHEAD CONFIGURATIONS



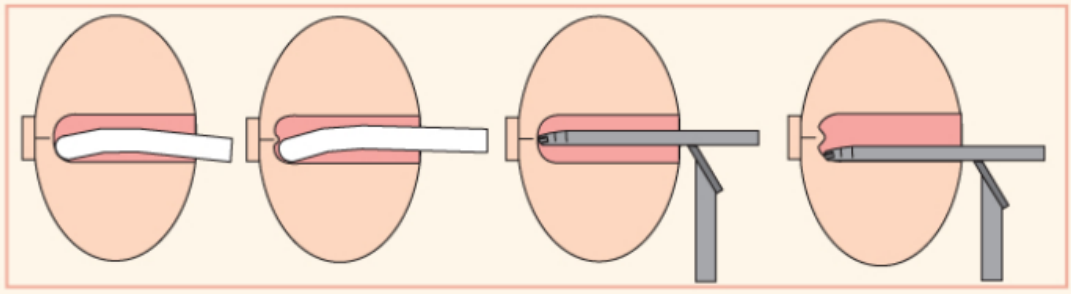
Here are a few possible cutterhead configurations. Note: when the cutting edge of the tool is in line with the tool shaft ther are no rotational forces affecting the tool handle. However once the cutting edge is out of line with the tool shaft and depending on the diffence between these more or less rotational force will be exerted. To counter these forces allow the cutter head rotate downwards to a lower position until smooth cutting is acheived.
Alternatively reduce the depth gauge cutter clearance until smooth cutting and control is acheived. note: see depth gauge adjustment. Although I have shown the almost staight cutter head configuration it almost never used as it directs shavings directly into the turners face. Even in boring operation I find it best to have the head slightly cranked thus allowing more of the cutter edge to tone side of centre.

LATHE SET UP

The Wundercutt10 is capable of both external and internal turning. The set up for the two operations is slightly different however. When working the exterior of a project the tool rest can be brought close to the work piece as well as below the work piece axis. However while hollowing in particular through an apeture smaller than 50mm, ideally the tool rest should be set to allow the tool to operateon a plane level with the work piece centre. This allows the cutter to find centre throughout the turning operation which is critical in achieving good form in the bottom of the hollowed form. If the tool is either too high or too low when arriving in the bottom of the hollowed form a cone can appear. Of course this can be corrected, but better to not develop one in the first place.

Preparation to Hollow

As the workpiece will have no tailstock centre for support, it will need to be well secured to a faceplate or chuck due to leverage while turning or boring near the entry point. The deeper and wider the form the greater the leverage on the fixing point. Many turners prebore the work before using a hollowing tool as the peripheral speed near centre is relatively slow and in some softer woods the shavings will not clear the depth gauge. The lathe speed is governed by the ability of shavings etc to clear the hollowed void. In an open bowl form shavings exit at speed, thereby making it possible to run the lathe faster. However in an enclosed form waist products can't escape as easily and high peripheral speed cause this material to pack the walls of greatest diameter where the centrifugal forces are greatest. While these shavings remain tightly packed the turner will experience increasingly rough cutting conditions. Time to clear out the debri using compressed air or a suction device such as a workshop vac. The simple solution is to slow the lathe down. The larger the diameter of the form the greater the forces so therefore the slower the lathe speed. Typically this will be between 600 - 1000 rpm for a tool of this depth range. As wood is such a variable material I can't give and absolute set of tables for this. By setting the depth gauge to a finer clearance the resulting waste will be lighter and less able to interfere with the tools cutting action.

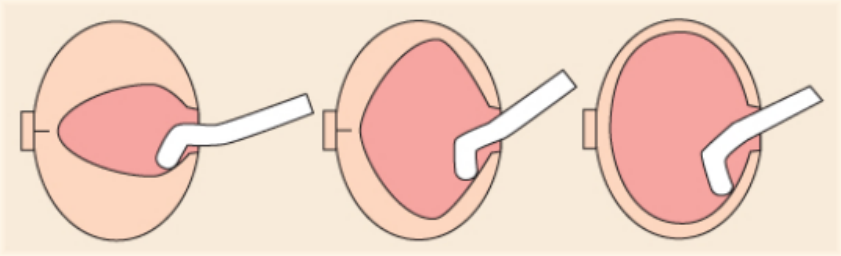


Holding the Tool and Posture

Because hollow turning often necessitates the extension of the tool shaft over the tool rest to almost half the entire tool length, much of the normal mechanical advantage is lost. To counter this loss a good posture and grip is advantageous. To help with orientaion of the cutter head while working areas where visibility is poor or non-existent the handle has a bulge on its underside, which in when used in combination with the shaft securing knob will help counter rotational forces which will be inevitably be encountered when the cutter head is extended out of alignment with the tool shaft.
If you are right handed ....here is a recipe for happy hollow turning.
The left hand is placed forwardmost and on top of the handle around the shaft securing knob while the right hand is placed on the upper surface of the handle just behind left hand. The end of the handle is placed under the arm and gently clamped against the body making the body, handle and arm one. For me this means the handle and shaft remain in line with my forearm. This way the tool is coupled with my body giving the unit far more mass than by holding the handle away from the body. Movement then comes mainly from my torso and legs. I find that if the lathe height is set so that my elbo is at the height of the lathes centre axis ie. the spindle . This method also makes it very easy to keep the tool working on the same plane as the lathe axis. Also beneficial is that my back stays relatively straight minimising backache from long hours on the lathe. Elbo and forearm and wrist strain is minimised because the upper and shorter part of the right arm combined with body gives better mechanical advantage.

Hollowing Sequence

All important in hollow turning is working with a planned sequence. A practice I try to adhere is first boring down close to my finish depth leaving enough material to support the workpiece while operations nearer the entry and the area of greatest diameter. If the lower wall is thinned to early finish cutting around the upper wall may vibrate to the point where finish cutting is rendered impossible.



Depth Gauge

The depth gauge adjustment controls the aggression of this tool. The practical variation of the gap between the leading edge of the depth gauge and the cutting edge of the cutter is between 0.05mm to 0.5 mm. So from what is not really visible to what is or in other words from the thickness of a piece of photo copy paper to the thickness of light card board.
Warning: if the depth gauge is opened too far the tool will become difficult to control or the cutter head will clog.



To Adjust the depth gauge

I usually put the tool handle between my legs so that I can hold the cutter head in my left hand and use the wrenches in my right hand.Insert the M2.5 allen key in the depth gauge screw socket and slacken just enough that the depth gauge can be moved back and forth with your fingers. For fine adjustment place the T15 Torx wrence in aperture on the right side of the cutter head (above) making sure the teeth of the Torx key engage the teeth in the lower plane of the depth gauge and rotate a few degrees back or forth. When the correct setting is acheived reset the depth gauge locking screw.



For roughing out a hollow in say a bowl form 0.5mm. For very fine finishing 0.05mm.I usually find that I can set the gap at say 0.25mm and do most of the work required by adjusting the cutter head angle to give greater or lesser cutting speed. If the head is angled so that the cutter bevel is lifted into its rubbing position it will cut at its most aggressive for the depth setting. By lowering the cutter head the depthgauge leading edge will limit cutter edge exposure thereby reducing cutter aggressiveness. Remember the depth gauge gap setting is resulting the shaving thickness. If the tool s cutter can't be dragged through the surface of a piece of similar wood by hand it is highly likely turning will be difficult at that setting. On the otherhand if the tool merely scrapes the test piece ineffectually then re-adjustment will be required.

Bowl

Internal Work

A wide vaiety of cutter head configurations can be acheived with the Wundercutt to deal with a myriad situations when making bowls and hollow forms.
Due to the geometry of the Cutter- depth gauge combination the tip will expose more than the sides of the cutter. The knowing turner can exploit this formation so that they can keep depth gauge adjustment to a minimum. In a single setting the plunging or push cut using the tool tip will be more aggressive than the reverse as up to 180 degrees of the round cutter can be bare on the work face. Drawing the tool backwards toward tool rest and employing the cutter side will allow far less of the cutting edge to make contact with the work face.
The depth Gauge leading edge is used a secondry bevel to control the rate of stock removal as well rotational forces when the tool cutterhead offset from the shaft axis.
By tilting the cutterhead a few degrees while in plunge cut mode in the direction of the curve being followed (as you would turn a bike) and rubbing the cutter head bevel while pushing toward centre you will acheive a more controlled than by trying to keep the tool head flat. In pushing mode tool should finish its stroke on centre otherwise a cone will grow in the vessel centre.

Cutting a lip or underside of a top plane in a hollow form the cutterhead will need to be offset so that the cutting tip can make contact with work surface. By approaching the fresh cut with the tool nose down so that the depth gauge makes contact with the work face first. Once the gauge is rubbing the tip is rotated upward until the desired cutting speed is acheived. The cutter travel can be either forward or backward depending on the required agressivess. Generally the surface is finished with the tool nose lowered and using it as you would a scraper.