

**DENFORD**
CAD/CAM Solutions & Projects for Education

Turn 270 / 370

Setting the Tools

8 Station Turret Guide

*QuickTURN 2D (V1.21)
VR CNC Turning (V1.40)*



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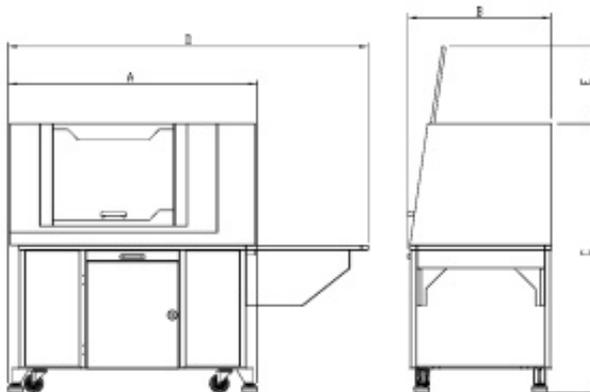
Turn 370 PRO

HIGH CAPACITY CNC LATHE

COMPLETE WITH
FLOOD COOLANT
AND INDUSTRIAL
CABINET BASE



Shown with optional
computer support extension
(PC not included)



Machine Dimensions.

A high capacity 2 axis CNC Lathe complete with flood coolant and industrial cabinet base and totally enclosed high-visibility interlocking guard, suitable for all levels of education and training. Programmable spindle speeds and feedrates make the Turn 370 PRO ideal for cutting a range of resistant materials such as wax, plastic, acrylic, free cutting alloys, aluminum and steel.

CE
APPROVED

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Introduction

The aim of this training guide is to show you how to set the 8 tools included in the Comprehensive Tooling Package for the 8 Station Turret on the Turn 270 and the Turn 370

This guide makes use of screen shots where possible and will use the following conventions:

Instructions will be in this format

Text to be typed will be in this format

Any software buttons to be pressed, a picture of the button will follow the instruction

This guide assumes that your software has already been installed and your machine has been commissioned.

If any of the features described in this manual are not operating as described please check that the version number you are using is the same as that shown on the front cover.

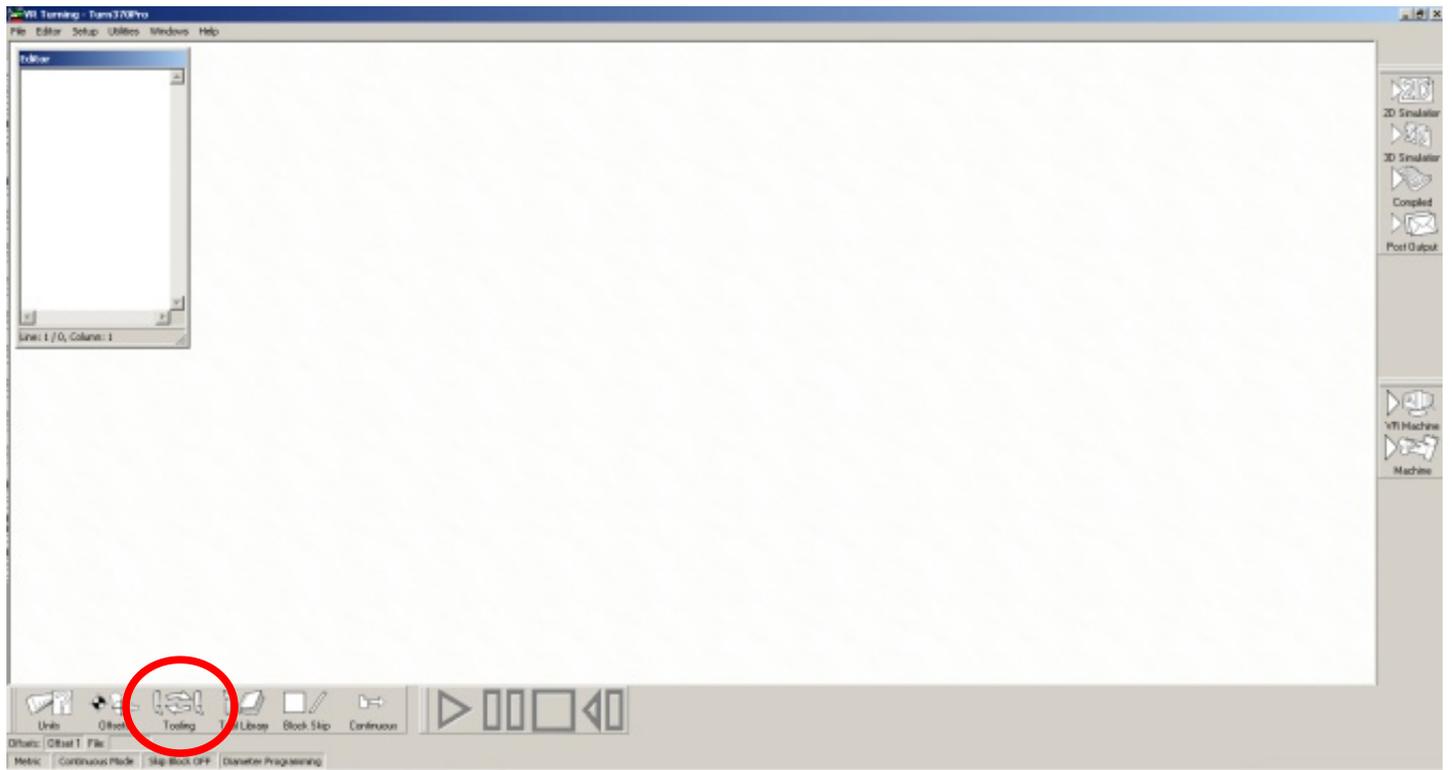
Version is written on the title bar of the main software window.

Denford provide machine training and it is recommended that you undertake the training and use this guide as a revision guide after completion of the machine training.

VR CNC Turning

Loading the Tooling

Click the "Tooling" button



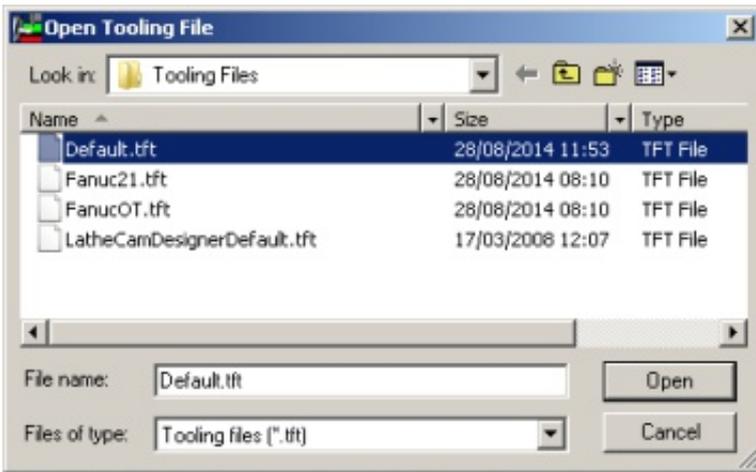
On the taskbar at the top of the VR CNC Turning software the 2nd option will have changed to read "Tooling".



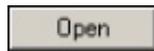
Select >Tooling >Open



Select the "Default" tooling file

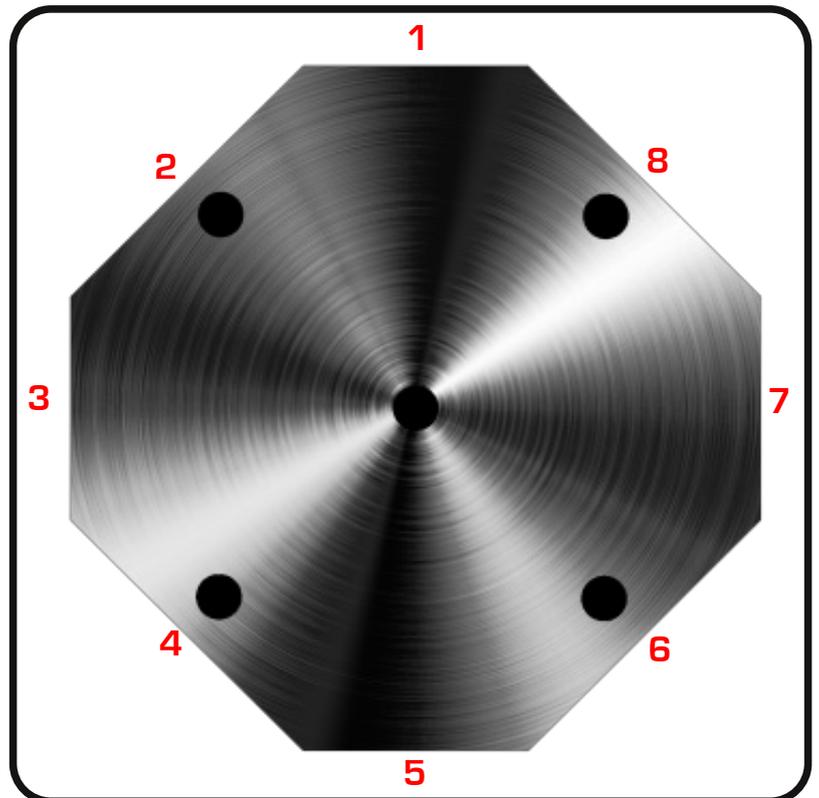
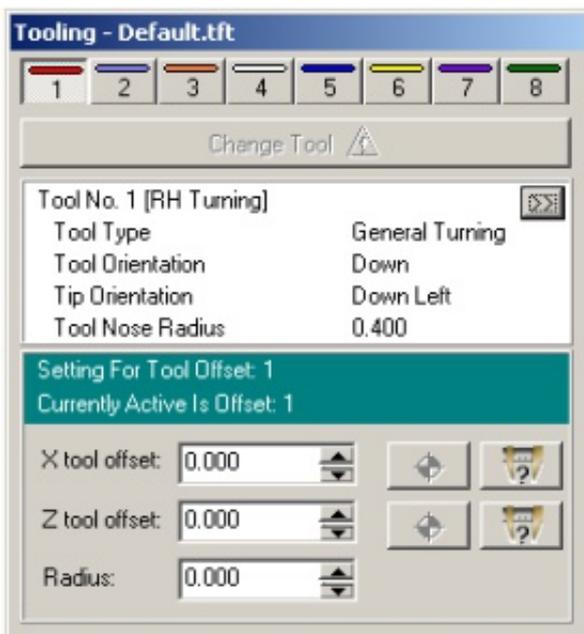
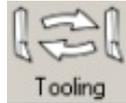


Click the "Open" button



Tooling Window

The tooling panel shown below should now have all 8 tools in the correct order, the tooling panel is accessed using the "Tooling" button.



The image on the right shows the layout of the 8 station turret

Lathe Tooling

Below are the numbers of the tools and their description:

Tool 1

Right Hand Turning



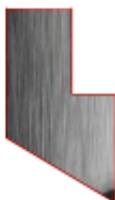
Tool 2

Right Hand Boring Bar



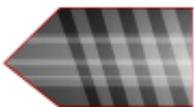
Tool 3

Left Hand Turning



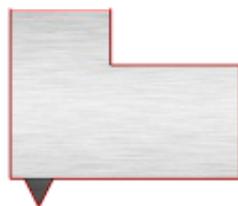
Tool 4

Drill Large (10mm)



Tool 5

Right Hand External Threading



Tool 6

Centre Drill



Tool 7

Right Hand Grooving / Parting



Tool 8

Drill Small (5mm)



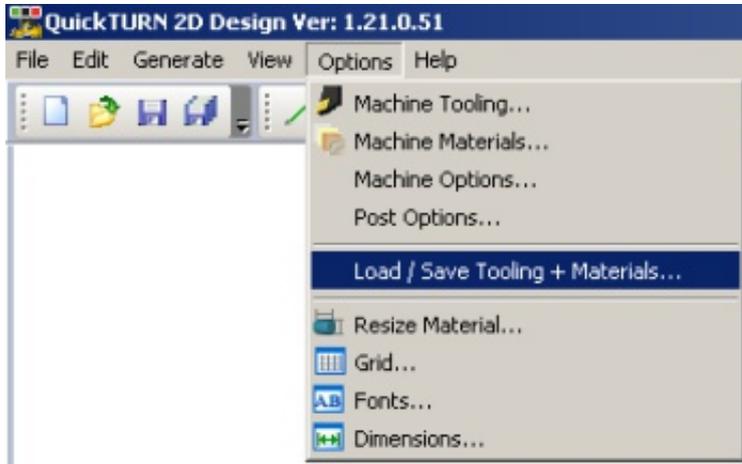
QuickTURN 2D Design

Load Tooling File

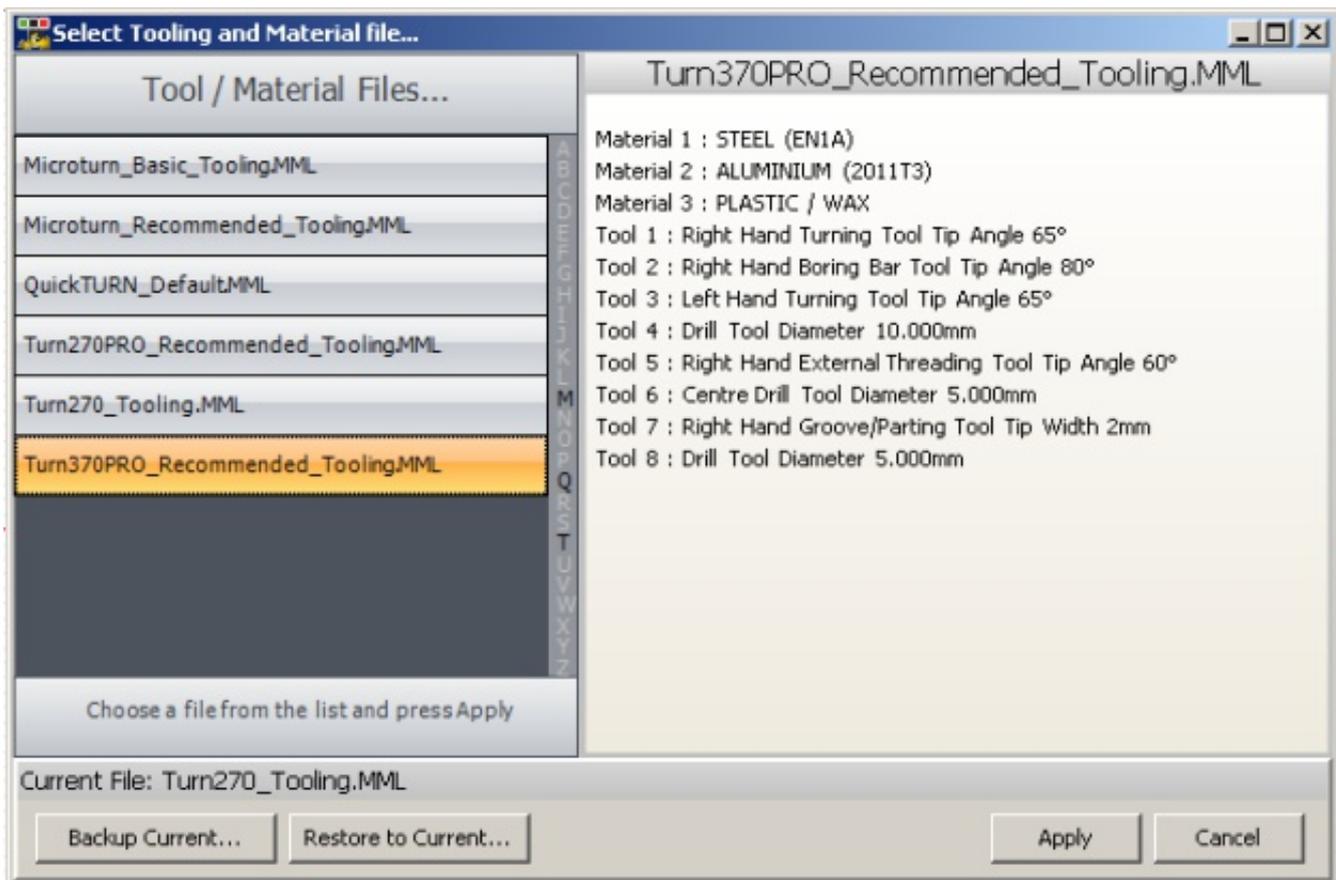
Having set up the tools in VR CNC Turning it is important to set the tools in the CAM package (QuickTURN 2D Design) to match.

The instructions below will show you how to set up the tools in QuickTURN 2D Design.

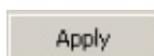
On the taskbar select >Options >Load / Save Tooling + Materials ...



Click on either the Turn 270_Tooling, the Turn 270Pro_Tooling, or the Turn 370Pro_Tooling



Click the "Apply" button

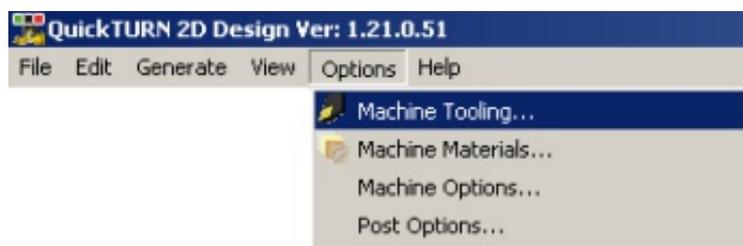


Your tools are now set in the CAM software, time to set the tool offsets in the Lathe.

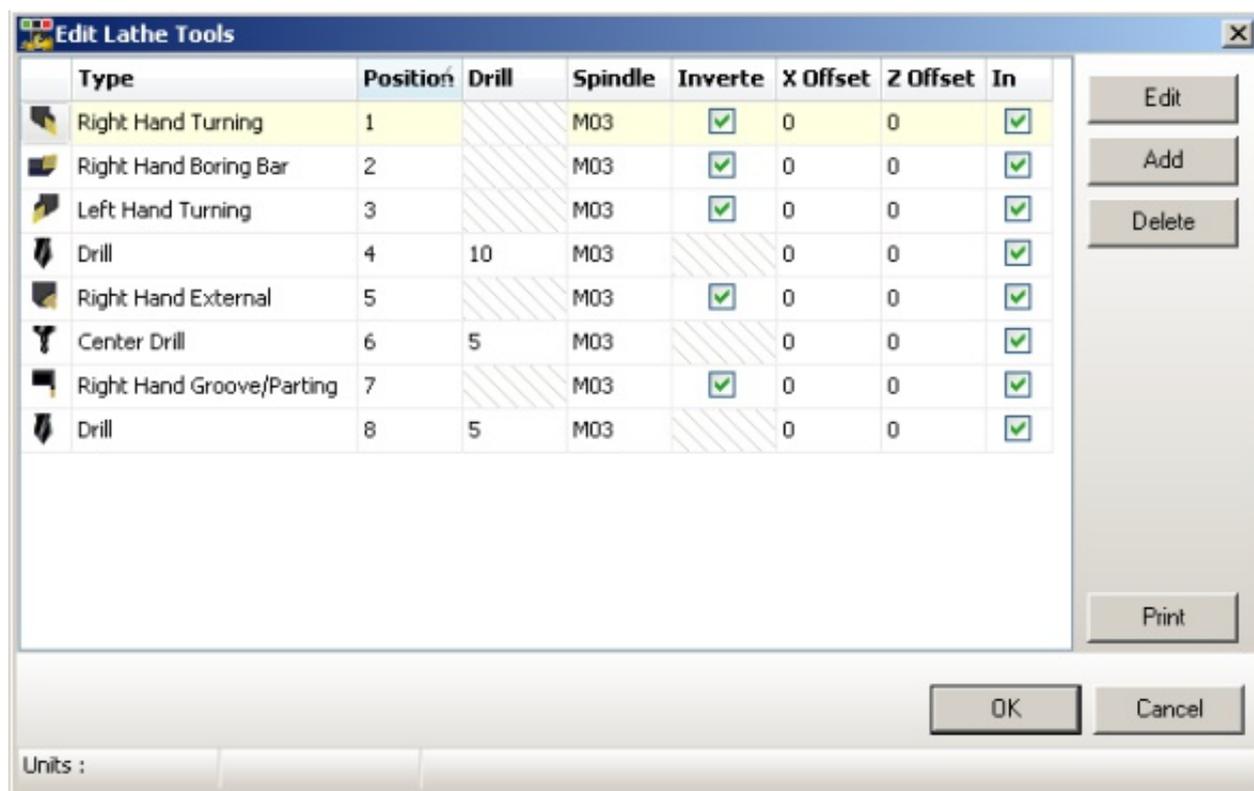
Machine Tooling

This is where we can check which tools QuickTURN 2D thinks are fitted to the lathe, if they differ from the tools that are fitted then you will have problems machining parts and will break tools.

Go to the toolbar and select Options> Machine Tooling



The window shown below will appear, and the tools should be set up as shown.



As you have loaded one of the preset tooling files, your tools should be in the right order.

Click the "OK" button



VR CNC Turning

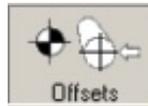
Having told VR CNC Turning and QuickTURN 2D which tools are fitted in the lathe we now need to set the offsets of the tools in VR CNC Turning.

When first connecting to the lathe and homing the axis the turret will automatically index round to tool 1, we will set this first.

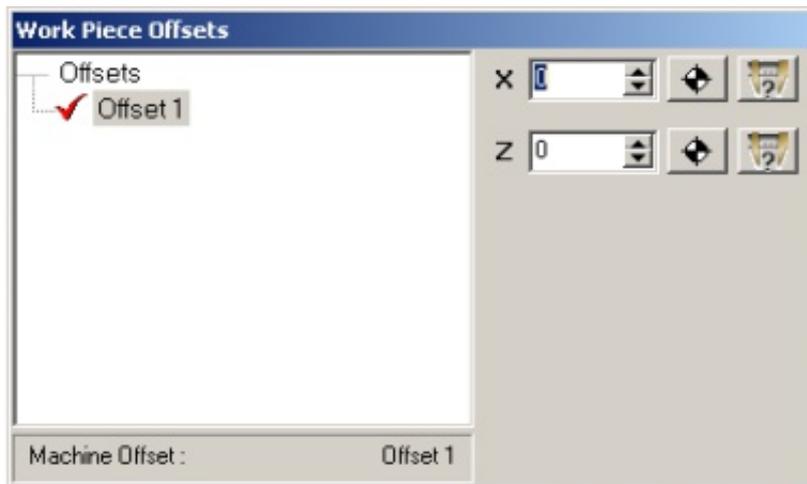
Tool 1

The Right Hand Turning tool should be set first using the "Offsets" button to open the Offsets Window.

Click the "Offsets" button



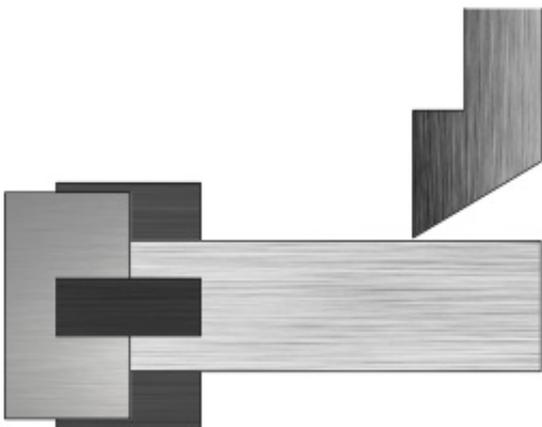
The Offsets window shown below will appear.



X Offset

The diameter of the bar is the X axis, we set this first.

With the spindle turned on, remove a small amount of material from the bar



Set the feedrate and spindle speeds to settings appropriate for the material in the chuck

For aluminium I find a feedrate of 150mm/min and spindle speed of 3000rpm works for me when removing less than 0.5mm from the billet.

Move the tool to the right (Z axis) so that it is not touching the bar, and stop the spindle

When the door unlocks, measure the bar diameter and click the "X offset" button



Enter the diameter and click the "OK" button



Z Offset

The length of the bar is the Z axis, Z=0 is the right hand side of the bar.

If wanting to use a 50mm bar I allow 65mm to stick out from the chuck as a safe margin and to prevent hitting the chuck when using Tool 3 (the tip of tool 3 is 15mm to the right of the side of the toolpost closest to the chuck).

With the spindle turned on, face off the bar.



Move the tool up (X axis) so that it is not touching the bar, and stop the spindle

Click the "Z offset" button



Enter Clearance=0, and click the "OK" button



Rename the Offset

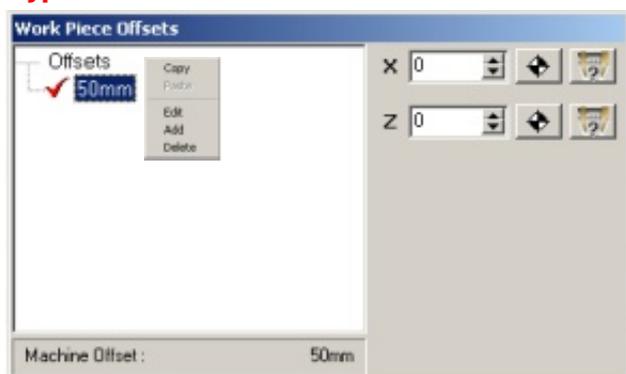
I find it easier to set up a new job if my offsets refer to the length of bar sticking out from the chuck, the active offset will have a red tick to the left of its name.

To rename the offset follow the instructions below:

Right click on the offset you wish to rename

Select "Edit"

Type the name for this offset and the "Enter" key on your keyboard



Close the Offset Window

Having set the X and Y offset for tool 1 we no longer need the offset window to be open.

Click the "Offset" button to close the window



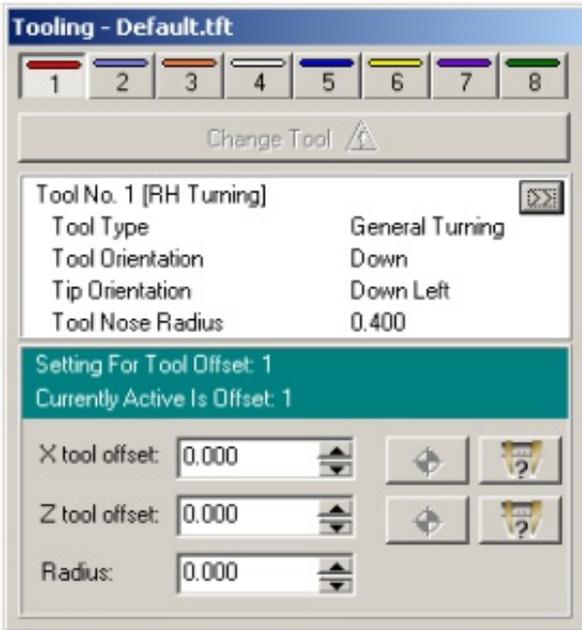
Setting Up Tools 2 to 8

Tools 2 to 8 take their offsets from tool 1 and are set under the Tooling window.

Click the "Tooling" button



The window shown below will appear:



Each of the 8 tools has its own button in the Tooling window, pressing a tooling button will display that tool's details in the window.

If the "Change Tool" button is selectable you will perform a tool change by clicking it.

Notice how each tool has an X and Z offset? we will use these to set each tool.

Tool 2

Click the "Tool 2" button

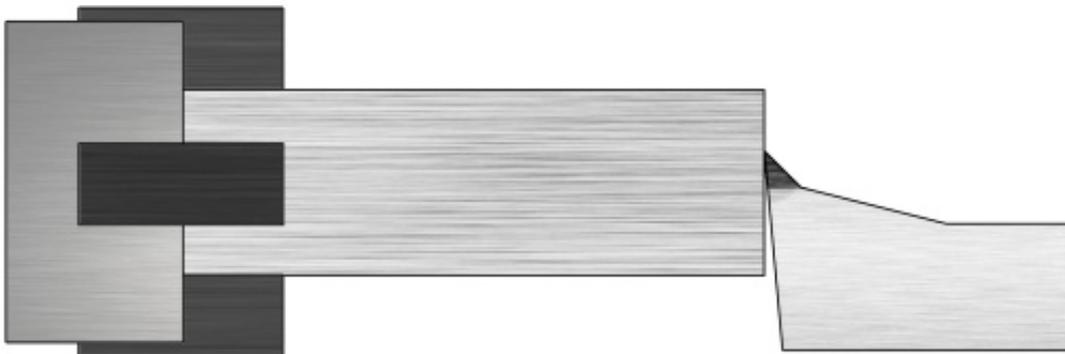
Click the "Change Tool" button

The lathe will now perform a tool change to tool 2, which is the boring bar.

As the boring bar is for internal work and we have a solid bar fitted in the chuck we can only set the Z offset, we will come back to the X offset later.

Z Offset

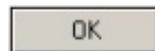
Touch the boring bar on the end of the billet where we faced off with Tool 1



Click the "Z offset" button



Enter Clearance=0, and click the "OK" button



Tool 3

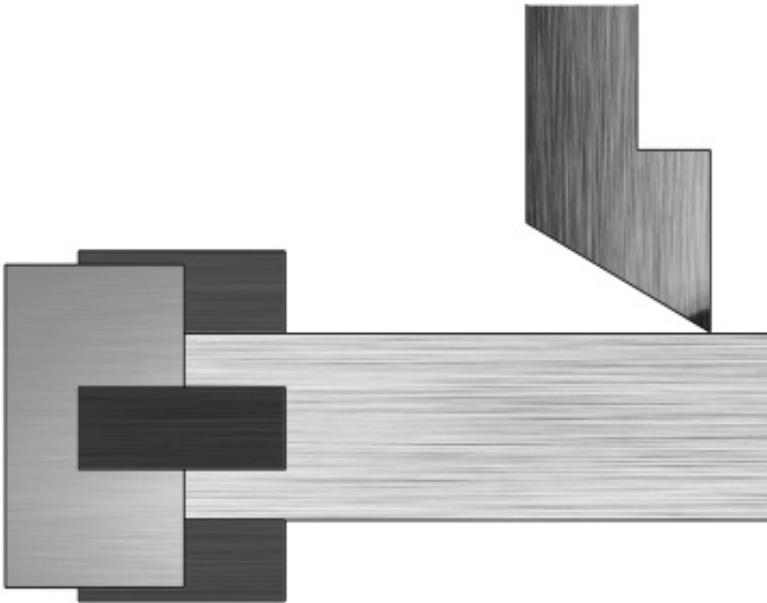
Change to Tool 3

This is a turning tool like tool 1, but on this tool the tip points to the right instead of the left. We will set the X offset first.

X Offset

The diameter of the bar is the X axis, we set this first.

With the spindle turned on, remove a small amount of material from the bar



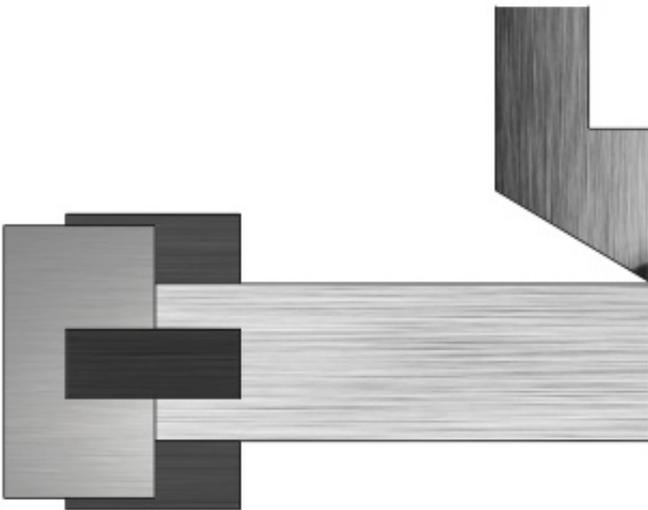
When the door unlocks, measure the bar diameter and click the "X offset" button

Enter the diameter and click the "OK" button

OK

Z Offset

With the spindle turned off and without moving the X axis you want to line the tip of the tool with face of the billet



Click the "Z offset" button

Enter Clearance=0, and click the "OK" button

OK

Tool 4

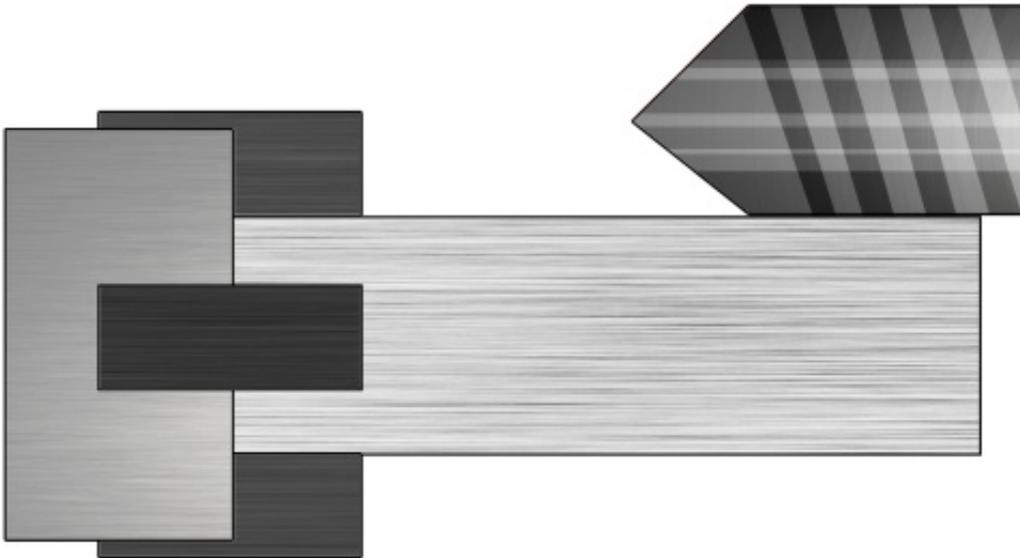
Change to Tool 4

This is a 10mm drill.

We will set the X offset first.

X Offset

With the spindle turned off, move the drill into position until it touches the billet



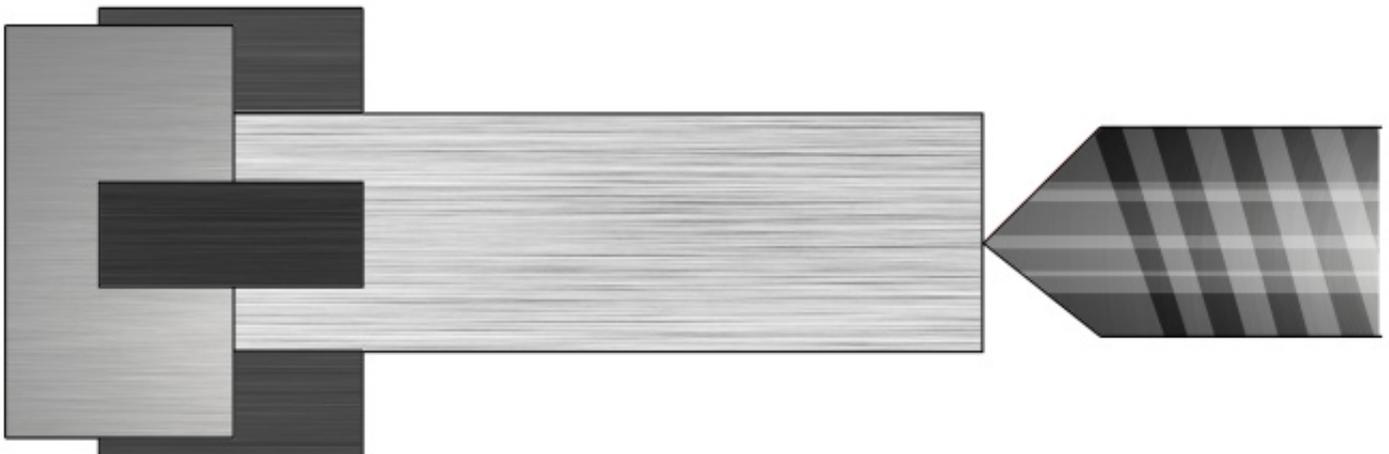
When the door unlocks, measure the bar and the drill diameter and click the "X offset" button 

Enter the diameter and click the "OK" button

OK

Z Offset

With the spindle turned off and without moving the X axis you want to line the tip of the tool with face of the billet



Click the "Z offset" button 

Enter Clearance=0, and click the "OK" button

OK

Tool 5

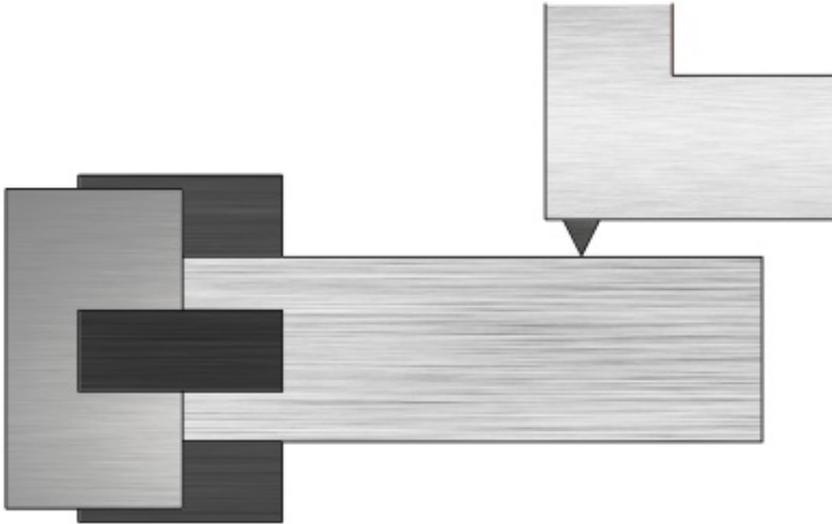
Change to Tool 5

This is an external threading tool.

We will set the X offset first.

X Offset

With the spindle turned on, remove a small amount of material from the bar



When the door unlocks, measure the bar diameter and click the "X offset" button

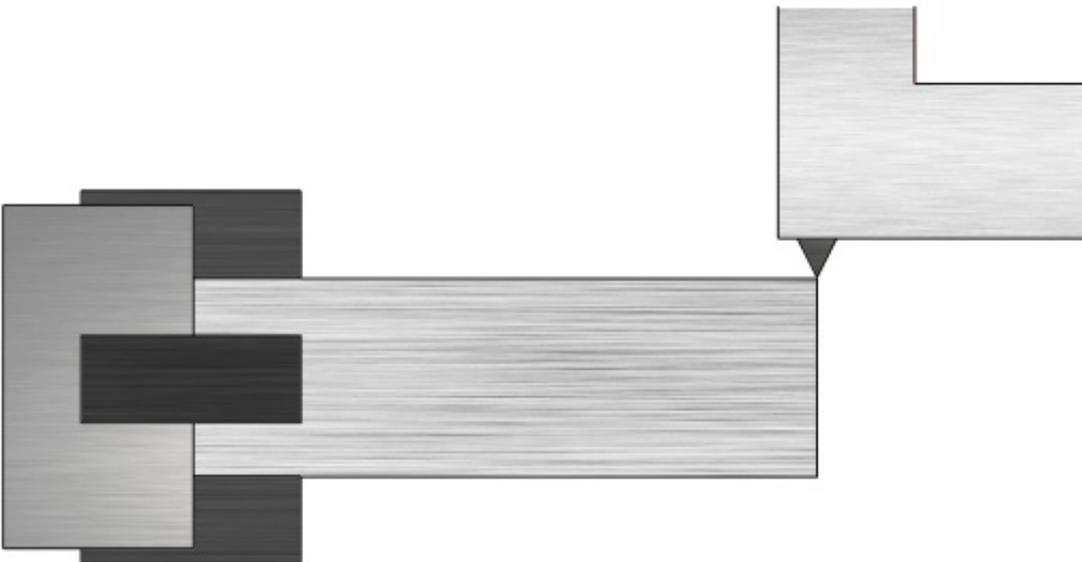


Enter the diameter and click the "OK" button



Z Offset

With the spindle turned off and without moving the X axis you want to line the tip of the tool with face of the billet



Click the "Z offset" button



Enter Clearance=0, and click the "OK" button



Tool 6

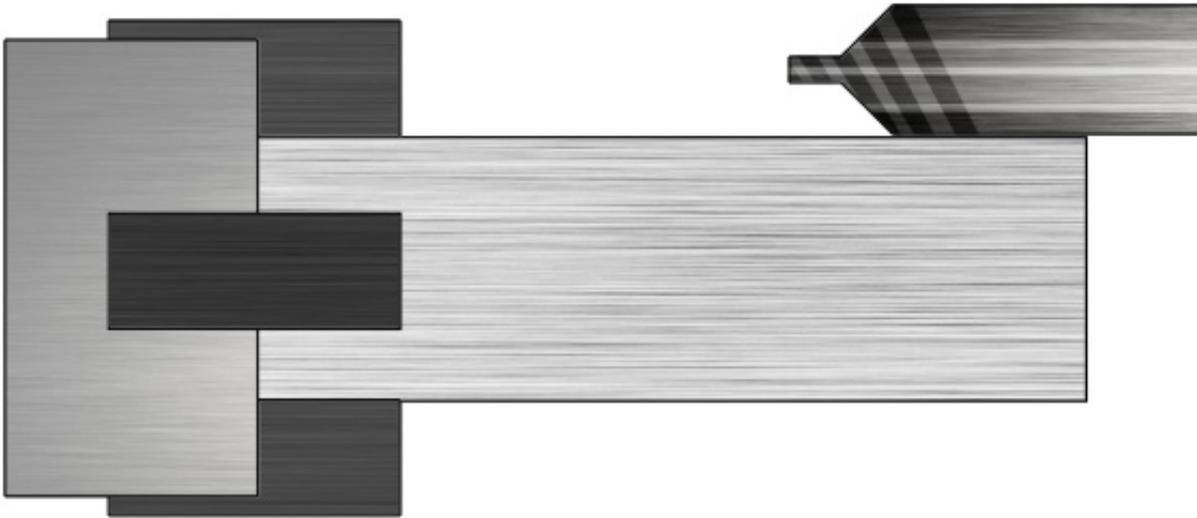
Change to Tool 6

This is a 5mm centre drill.

We will set the X offset first.

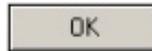
X Offset

With the spindle turned off, move the drill into position until it touches the billet



When the door unlocks, measure the bar and the drill diameter and click the "X offset" button 

Enter the diameter and click the "OK" button



Z Offset

With the spindle turned off and without moving the X axis you want to line the tip of the tool with face of the billet



Click the "Z offset" button 

Enter Clearance=0, and click the "OK" button



Tool 7

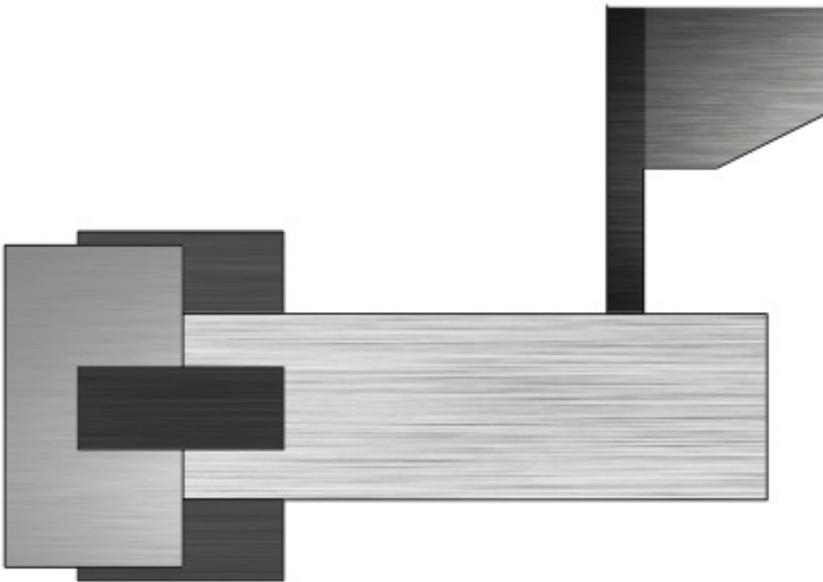
Change to Tool 7

This is grooving / parting tool.

We will set the X offset first.

X Offset

With the spindle turned on, remove a small amount of material from the bar



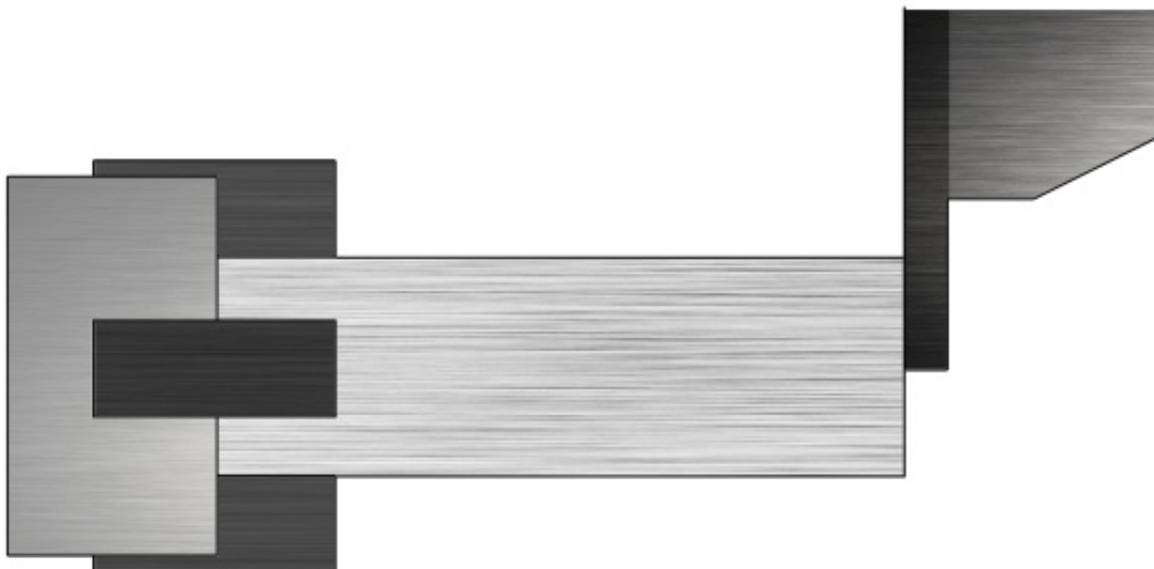
When the door unlocks, measure the bar diameter and click the "X offset" button

Enter the diameter and click the "OK" button



Z Offset

With the spindle turned off and without moving the X axis you want to line the tip of the tool with face of the billet



Click the "Z offset" button



Enter Clearance=0, and click the "OK" button



Tool 8

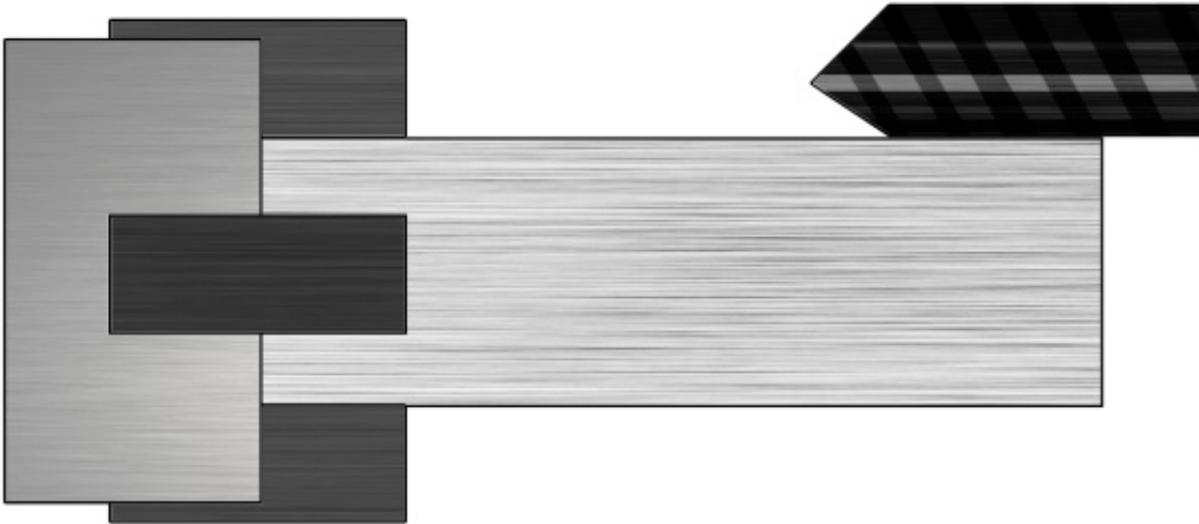
Change to Tool 8

This is a 5mm drill.

We will set the X offset first.

X Offset

With the spindle turned off, move the drill into position until it touches the billet



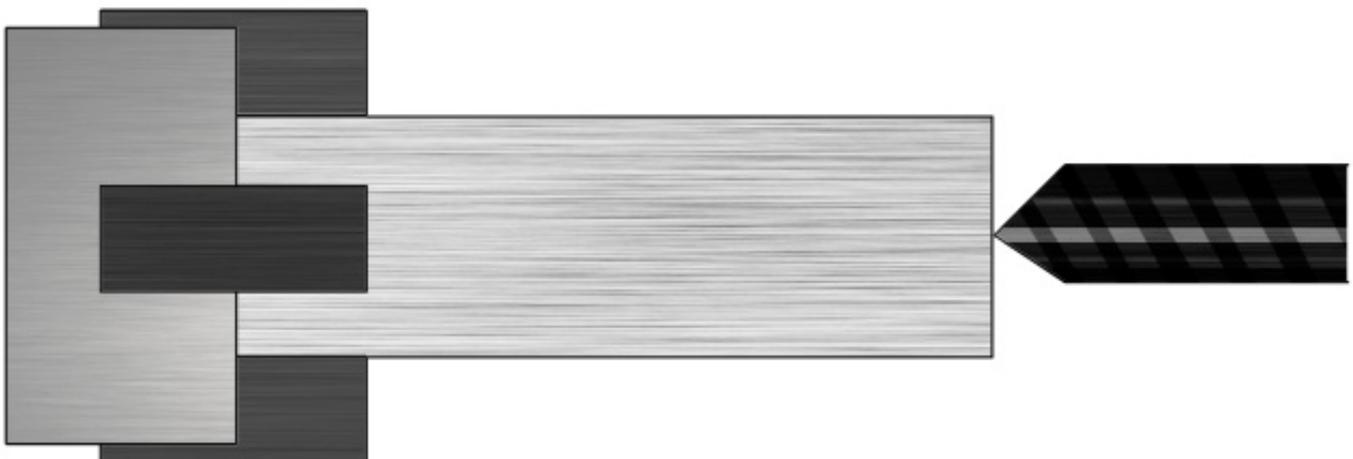
When the door unlocks, measure the bar and the drill diameter and click the "X offset" button 

Enter the diameter and click the "OK" button

OK

Z Offset

With the spindle turned off and without moving the X axis you want to line the tip of the tool with face of the billet



Click the "Z offset" button 

Enter Clearance=0, and click the "OK" button

OK

Tool 2

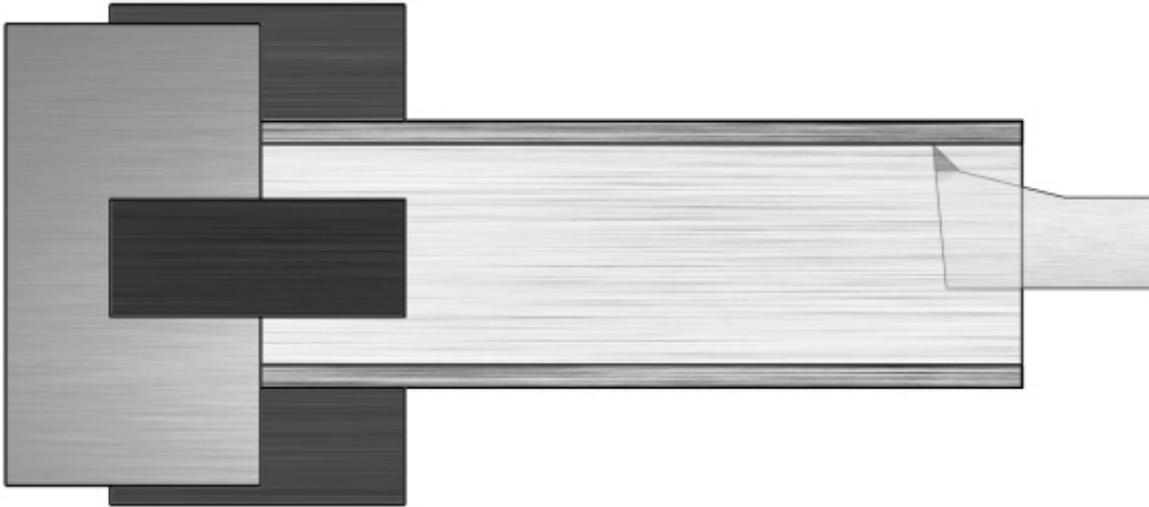
As we did not want to move the billet from the chuck before setting the Z offset on all 8 tools we were unable to set the X offset for the boring bar earlier.

Remove the billet from the chuck and fit a peice of tube

Change to Tool 3

X Offset

With the spindle turned on, remove a small amount of material from the inside of the tube



When the door unlocks, measure the internal diameter click the "X offset" button



Enter the diameter and click the "OK" button

OK

All Tool Offsets Complete

Having set all 8 tool offsets you can now close the Tooling Window.

Click the "Tooling" button to close the window.

Your lathe is now setup and ready to use, design a part in QuickTURN 2D and use VR CNC Turning to machine it.

End Of Document

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Denford's Technical Forum is a free of charge on-line technical support service that is available to Denford customers 24 hours a day, 7 days a week.

"The technical forum has provided a wealth of information and support for our 20-year-old Denford CNC machine, in fact just as good as the support we receive for our brand new CNC Router!"



Denford's On-Line Technical Forum is a free of charge service that can be accessed 24 hours a day, 7 days a week.

The On-Line Technical Forum is available to Denford customers, old and new, and it couldn't be easier to use. Just visit <http://www.denfordata.com/bb/> and register on line.....it's that simple.

Denford's On-Line Technical Forum opens up the traditional communication channels that can restrict customer and technical support, due to availability of staff, teaching commitments or different time zones.

A multitude of topics relating to Denford machines and software (both new and old) are covered within the forum, which is simple to search, and easy to use.

Denford's Technical Team and Denford customers from around the world regularly log on to the forum to offer support and advice and, most importantly, post a solution for all to see.

As well as offering comprehensive technical support, Denford's On-Line Technical Forum enables customers to share ideas and projects with other users. Media such as teaching material, project work, PDF's, images, drawings and text documents are easily attached to messages for all users to view and comment on.

You can also read the latest Denford news before anyone else, and keep track of machine and software upgrades, some of which can be downloaded direct from the Technical Forum web site.

The On-Line Technical Forum has proved to be hugely popular with customers. One recent user posted a note to inform us that the Technical Forum has "provided a wealth of information and support for our 20-year-old Denford CNC machine, in fact just as good as the support we receive for our brand new CNC Router!"

Of course the traditional methods of phone and email are still available, but try out this new service by simply logging on to www.denfordata.com/bb/ and register.



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