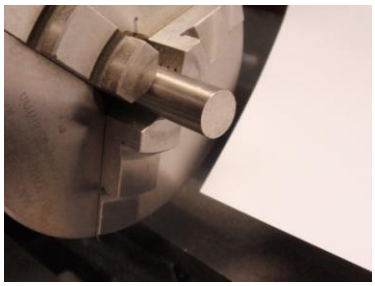
There are a number of ways to do things and each has some specific details associated with them. SO it can get confusing, BUT, in general, one is accomplishing the same thing.

To prep for setup and define a basis for the tool offsets there are basically three ways and exactly how you use the screen set will vary. They are:

- Manually
- Turning down and measuring
- Automated (varies in degree)

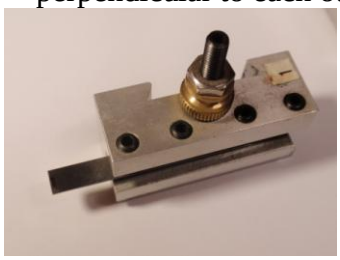
Each step in the process can have variations on exactly what is used and how done. With that thought in mind, the following tries to keep things simple so one can get the point and do as they wish.

1. Need a reference to relate the tool to.
   A piece of ground rod with the one end perpendicular to axis of the rod can be used.

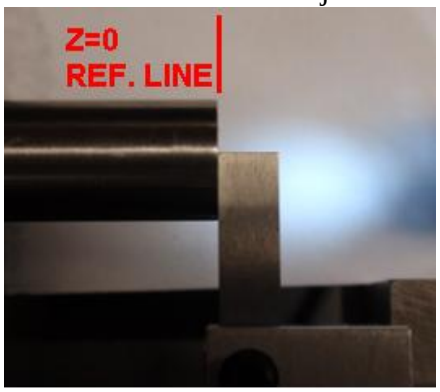


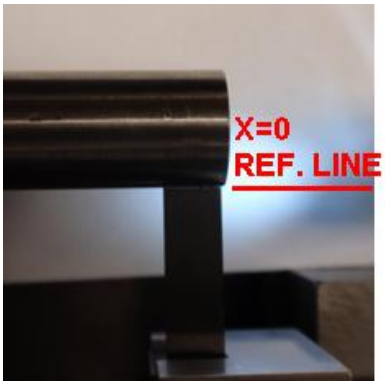
Indicate the rod so it is located on the lathe center, the rod should be parallel to the Z axis.

2. Need a tool to be used as the master. A piece of ground carbide with end and face perpendicular to each other can be used.

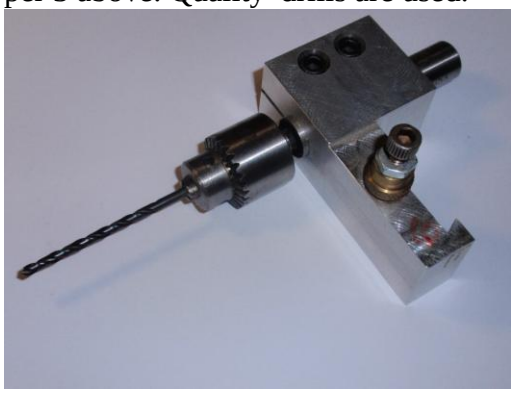


3. **Fix** the quick tool change **post** such that the face and end of the master tool are aligned properly with the reference rod. All other tools will be touched off to the same surfaces. All the other tools are adjusted in their holders to suite the cutting edges.





3A. For drills and reamers one will touch off to the same reference but adjust the X offset to account for the tools diameter. It can be a PITA to set the drill just right so that it's length is parallel to the Z axis depending on the tool holder used. Suggestion is to use a drill blank instead of a drill bit or reamer, or a collet holder in the quick change. I use a home made tool holder which has a "quality" drill chuck to hold the drills or reamers. As shown when a drill blank is put in the chuck it's parallel to the Z axis with the post set per 3 above. Quality drills are used.



4. Populate the tool table based on the master tool.
- Manually
- Turning down and measuring
- Automated (varies in degree)

I probe the tools so the task is semi-automatic. I also use a custom screen set which makes the task quicker, easier, and less prone to making a mistake.

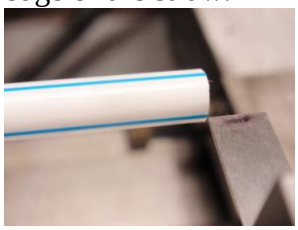
5. Post populating the tool table one should do a quick check to see that there are no errors in the tool table.

QUICK TEST OF TOOL OFFSETS (FRONT TOOL POST ONLY)

The intent of this test is to quickly test if some gross error was made when populating the tool table or one incorrectly adjusted a tool offset. In the nine steps below one will reference the machine some distance from end of the test piece where you can change tools and create a work offset to the test piece.
Set the lathe Mode to RADIUS (Config>Ports & Pins> Turn Options) tick Radius.

1. -Select Machine Coordinate display for the DRO's using the button 

   -Set Tool Post to FRONT via the button 

   - set the tool number to 0 or 1
2. Put a straw or something flexible into the chuck.
3. With the master tool inserted into the holder, move the Master Tool's Edge to the edge of the straw.
   
   - click Zero World X button and & Zero World Z button 

4. Move via an MDI command or jog step to a location such that "all" of the tools can be inserted into the tool holder.
   - Say X=1 and Z=3 some easy numbers
   - Click Zero World X button and & Zero World Z button 

   - Click Set Home X and Set Home Z button 

   The machine is now referenced and the tool change position happens to be at MC X&Z=0
5. Now move the master tool back to the straw edge back
   - click PART display button 

   - Click ZERO button for the X axis and ZERO button for the Z axis 

   You have just created a G54 offset
6. Click the Home All button
7. - set the tool number to the next tool(ie; 2)
   - remove the current tool and insert the new / next tool into the holder
8. MDI G0 X0 ZO
   (note that you are in Part coordinates and any tool offset is applied and also note That with the cursor in the MDI you can just index up and select a previous command)
9. REPEAT STEPS 6,7,8 for all the tools.

You will quickly see if a tool offset is not correct as the tool will not go to the reference point.

RICH