

## Setting Part Zero and Setting Cutting Tool for Wheel Lathe

### There are three sections in this document:

- A:** Setting Tool #1 and Tool #2 on center line height to the spindle which are explained in steps 1 thru 3
- B:** Setting Part 0 for X & Z and setting X & Z reference with the probe which are explained in steps 4 thru 16
- C:** Setting the tool offset for Tool #2 which is explained in steps 17 thru 25

### Note:

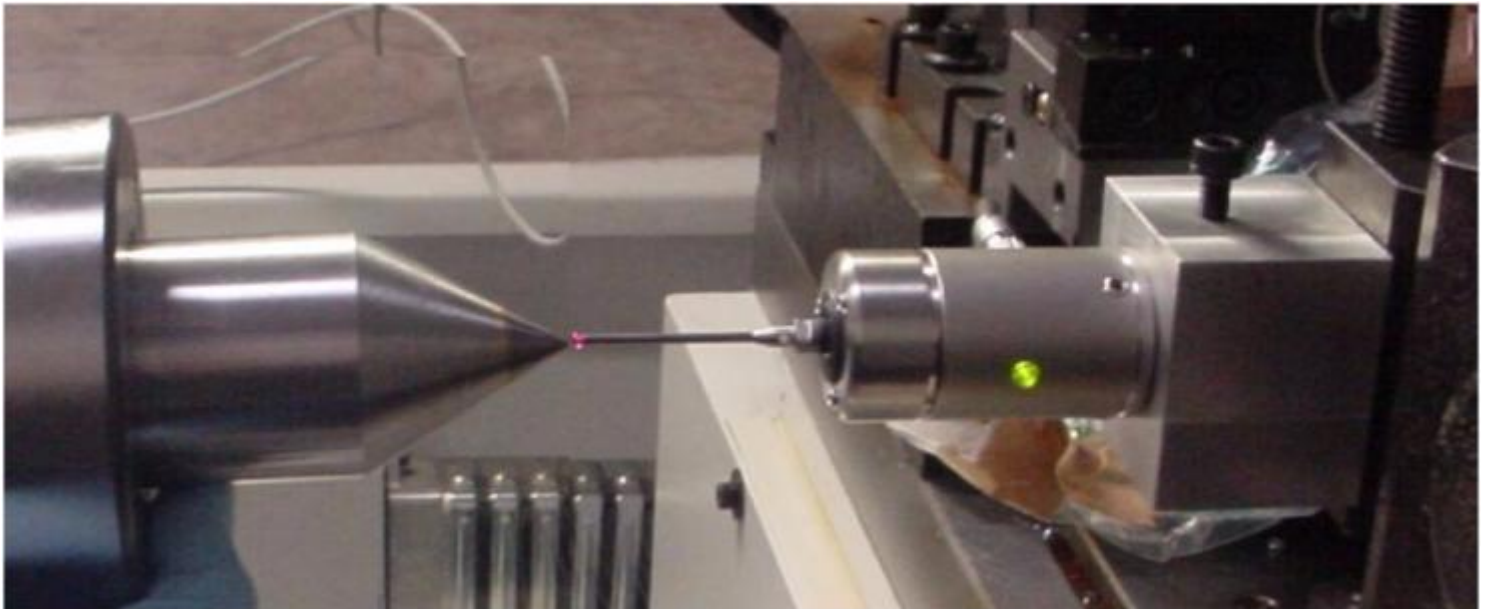
- \*The probe, Tool #1, is the reference tool. Make sure the X and Z offset are set to 0 before starting.
- \*Do not remove your probe out of the tool holder. Remove the whole holder from the tool post. If you do remove the probe from the holder, when you put the probe back you will have to reset the probe and the turning tool.
- \*Do not remove Tool #2 out of its holder. Replace the diamond insert only and keep Tool #2 in the holder. If you do remove the tool from the holder than you will need to reset your tool offset library for tool #2.
- \*Remember your probe has been used to collect all your wheel data at the same position (same geometry coordinate system) so do not remove the probe from the master tool holder to a different position.

### A: Setting Tool #1 and Tool #2 on center line height to the spindle

Tool #1 is the digitizing probe for digitizing the face of the wheel.  
Tool #2 is the tool for cutting the face of the wheel.

#### 1. Setting Tool # 1 at the center of the spindle

Using the 3-jaw chuck to hold an adapter and dead center, insert Tool #1 in the 2-way tool post and move X and Z axes close to the center point. Adjust the tool holder up and down until Tool #1 is aligned to the center of the dead center as shown in Picture 1.



Picture 1

## Setting Part Zero and Setting Cutting Tool for Wheel Lathe



Picture 2

2. With Tool #1 at the center of the spindle, tighten the adjustment screw nut to secure the position and make a reference mark on the adjusting level screw for future reference as shown in Picture 2.
3. Set Tool # 2 at the center of the spindle  
Remove Tool #1 and insert Tool #2. Repeat the same procedure for Tool #2 as was done for setting Tool #1 up and down. Now, Tool #1 and Tool #2 are the same center point up and down.

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### B. Setting Part 0 for X & Z and setting X & Z reference with the probe.

4. Load Tool #1 into the tool post. Press **F3-MDI**. Type **T0101** and press **Cycle Start** as shown in Screen Shot 1.



Screen Shot 1

5. After you press Cycle Start, you will see Tool: T0101 at the top right of the monitor.
6. Press ESC to go back to the main screen.
7. Before you go any further you need to make sure that there aren't any offsets in the Tool Offset and the Tool Wear Adjustment menus for any of the tools. Press the **F9-Tool Wear** to go to the Tool Wear Adjustment menu. Press **F1-Clear All** to clear all of the offsets if any are entered. Press **F2-Tool Offset**. When prompted, answer yes to save the changes. Move the cursor to highlight Tool #1. If X and Z offsets are 0, you do not need to do anything. If they are not 0, highlight the offset with Entry mode: set to absolute, type 0, then press ENTER. Do the same for the other offset for Tool #1. Press **F10-Save** to save the changes. This will take you back to the Tool Wear Adjustment screen. Press ESC to get back to the main screen.

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8. Jog X and Z axes slowly to the center point of dead center with Tool #1 as shown in Picture 1.
9. Press **F1-Setup** then **F1-Part**. Set Z Part Position to 0.0 with Tool #1 and press **F10-Set** as shown in Screen Shot 2.

**Note:** Part Z0.0 will be set at a different position later when the wheel is mounted onto the lathe.

The screenshot displays a CNC control interface with a dark blue background and yellow text. At the top left, it shows 'WCS #1 (G54) Current Position (Inches)' with 'X' at '+5.8000' and 'Z' at '+0.0000'. To the right, job information includes 'Job Name: mpu11wheelplain-v2.txt', 'Tool: T0101', 'Feedrate: 100% 0.0 ipm', and 'Spindle: -188 M'. A status window on the right shows a sequence of events: '301 Stopped', '304 MDI...', '309 Waiting for CYCLE START button', '304 MDI...', '307 Operator abort: job cancelled', and '301 Stopped'. Below this, the screen is titled 'Set Z Part 0/Position' and lists three steps: '1) Jog to Touch Off on Part', '2) Edit the Value if Necessary', and '3) Press F10 to Set Position'. A small diagram shows a tool touching a part. A table below the diagram shows 'Axis Z' with 'Part Position' set to '0.0000' and 'Tool Number' set to '1'. At the bottom, a row of function keys is visible: 'Prev WCS F6', 'Next WCS F7', 'Set X F8', 'WCS Table F9', and 'Set F10'.

Axis	Part Position	Tool Number
Z	0.0000	1

Prev WCS F6	Next WCS F7	Set X F8	WCS Table F9	Set F10
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Screen Shot 2

## Setting Part Zero and Setting Cutting Tool for Wheel Lathe

10. Press **F8-Set X**.

WCS #1 (G54) Current Position (Inches)

X  $+0.0000$

Z  $+0.0000$

Job Name: mpu11wheelplain-v2.txt  
Tool: T0202  
Feedrate: 100% 0.0 ipm  
Spindle: -188 M  
Coolant

301 Stopped  
307 Operator abort: job cancelled  
301 Stopped  
304 MDI...  
307 Operator abort: job cancelled  
301 Stopped

Set X Part 0/Position

1) Jog to Touch Off on Part  
2) Edit the Value if Necessary  
3) Press F10 to Set Position

WCS #1 (G54)

Axis	Part Position	Tool Number	Set all WCS
X	0.0000	2	Yes

Press SPACE to change

Prev WCS F6	Next WCS F7	WCS Table F9	Set F10
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Screen Shot 3

11. Set X Part Position to 0.0 and move the cursor over to “Set all WCS” field. Toggle to “Yes” by pressing the SPACE BAR as shown in Screen Shot 3 and press **F10-Set**.

12. Press ESC twice to go back to the Setup menu.



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13. Press **F2-Tool Offset** to go to the Tool Library to set the X & Z reference. If the “X Diam: and Z Ref:” have not been set yet they will say “Not set” as shown in Screen Shot 4. If there are values in those fields, the next steps will set them correctly for this setup.

WCS #1 (G54)    Current Position (Inches)    Job Name: mpu11wheelplain-v2.txt  
 X: +0.0000    Tool: T0101    Feedrate: 100% 0.0 ipm  
 Z: +0.0000    Spindle: -188 M  
 Coolant

Tool Library

Off. #	Tool Loc	Tool Orient	Tool Type	Approach	X Offset	Z Offset	Nose Radius	Nose Vector	Spin Dir	Description
01	T01	FFace	Custom	Front	0.0000	0.0000	0.1250	7	CW	Probe
02	T02	FFace	Turn	Front	0.0000	0.0000	0.1250	7	CW	Turning tool
03	T03	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
04	T04	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
05	T05	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
06	T06	FFace	Turn	Front	0.0000	0.0000	0.0313	7	CW	
07	T07	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
08	T08	FFace	Turn	Front	0.0000	0.0000	0.0313	7	CW	
09	T09	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
10	T10	FFace	Turn	Front	0.0000	0.0000	0.0000	7	CW	

X Diam: Not set    Z Ref: Not set    Entry mode: absolute

Measure Tool (F2)    Abs Inc (F4)    Tool Wear (F9)    Save (F10)

Screen Shot 4

## Setting Part Zero and Setting Cutting Tool for Wheel Lathe

14. Move the cursor over to the “X Offset” field. Press **F1-X Diam** to set the X diameter to 0.0 as shown in Screen Shot 5.

WCS #1 (G54)    Current Position (Inches)    Job Name: mpu11wheelplain-v2.txt  
 X  $\leftrightarrow$     +0.0000    Tool: T0101  
 Z    +0.0000    Feedrate: 100% 0.0 ipm  
 Spindle: -188 M  
 Coolant

Tool Library

Off. #	Tool Loc	Tool Orient	Tool Type	Approach	X Offset	Z Offset	Nose Radius	Nose Vector	Spin Dir	Description
01	T01	FFace	Custom	Front	0.0000	0.0000	0.1250	7	CW	Probe
02	T02	FFace	Turn	Front	0.0000	0.0000	0.1250	7	CW	Turning tool
03	T03	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
04	T04	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
05	T05	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
06	T06	FFace	Turn	Front	0.0000	0.0000	0.0313	7	CW	
07	T07	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
08	T08	FFace	Turn	Front	0.0000	0.0000	0.0313	7	CW	
09	T09	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
10	T10	FFace	Turn	Front	0.0000	0.0000	0.0000	7	CW	

X Diam: 0.0000  
 Z Ref: Not set  
 Entry mode: absolute

X Diam F1	Abs Inc F4	Measure offset X F5	Measure offset Z F6	Tool Wear F9	Save F10
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Screen Shot 5

## Setting Part Zero and Setting Cutting Tool for Wheel Lathe

15. Now move the cursor over to “Z Offset” field. Press **F1-Z Ref** to set the Z reference to 0.0 as shown in Screen Shot 6.

WCS #1 (G54) Current Position (Inches) Job Name: mpu11wheelplain-v2.txt  
 X  $\longleftrightarrow$  +0.0000 Tool: T0101  
 Z +0.0000 Feedrate: 100% 0.0 ipm  
 Spindle: -188 M  
 Coolant

Tool Library

Off. #	Tool Loc	Tool Orient	Tool Type	Approach	X Offset	Z Offset	Nose Radius	Nose Vector	Spin Dir	Description
01	T01	FFace	Custom	Front	0.0000	0.0000	0.1250	7	CW	Probe
02	T02	FFace	Turn	Front	0.0000	0.0000	0.1250	7	CW	Turning tool
03	T03	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
04	T04	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
05	T05	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
06	T06	FFace	Turn	Front	0.0000	0.0000	0.0313	7	CW	
07	T07	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
08	T08	FFace	Turn	Front	0.0000	0.0000	0.0313	7	CW	
09	T09	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
10	T10	FFace	Turn	Front	0.0000	0.0000	0.0000	7	CW	

X Diam: 0.0000  
 Z Ref: 0.0000  
 Entry mode: absolute

Z Ref	Abs Inc	Measure offset X	Measure offset Z	Tool Wear	Save
F1	F4	F5	F6	F9	F10

Screen Shot 6



## Setting Part Zero and Setting Cutting Tool for Wheel Lathe

### C: Setting the tool offset for Tool #2.

16. Move Tool #1 away from the spindle and remove Tool #1.
17. Load Tool #2 into the tool post. Press ESC twice to go back to the main screen. Press **F3-MDI**, type **T0202**, and press **Cycle Start** as shown in Screen Shot 7.



Screen Shot 7

## Setting Part Zero and Setting Cutting Tool for Wheel Lathe

18. Move Tool #2 to the X and Z center point. The values that are displayed on the DRO are the difference between the Tool #1 and Tool #2. Press **F1-Setup** then **F2-Tool Offset** to go to the Tool Library to set the offsets for Tool #2.
19. Move the cursor to highlight the "X Offset" field for Tool #2 then press **F2-Measure Tool**.

WCS #1 (G54) Current Position (Inches) Job Name: mpu11wheelplain-v2.txt  
 X  $\pm$  +0.2159 Tool: T0202  
 Z -1.4500 Feedrate: 100% 0.0 ipm  
 Spindle: -188 M  
 Coolant

Tool Library

Off. #	Tool Loc	Tool Orient	Tool Type	Approach	X Offset	Z Offset	Nose Radius	Nose Vector	Spin Dir	Description
01	T01	FFace	Custom	Front	0.0000	0.0000	0.1250	7	CW	Probe
02	T02	FFace	Turn	Front	0.2159	0.0000	0.1250	7	CW	Turning tool
03	T03	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
04	T04	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
05	T05	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
06	T06	FFace	Turn	Front	0.0000	0.0000	0.0313	7	CW	
07	T07	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
08	T08	FFace	Turn	Front	0.0000	0.0000	0.0313	7	CW	
09	T09	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
10	T10	FFace	Turn	Front	0.0000	0.0000	0.0000	7	CW	

X Diam: 0.0000  
 Z Ref: 0.0000  
 Entry mode: absolute

X Diam F1      Abs Inc F4      Measure offset X F5      Measure offset Z F6      Tool Wear F9      Save F10

Screen Shot 8







## Setting Part Zero and Setting Cutting Tool for Wheel Lathe

24. Move the cursor to highlight the “Nose Radius” field. Enter the radius of the insert for Tool #2 and the probe tip radius for Tool #1. If the probe tip diameter is metric, you can press the “=” key then type the probe tip diameter divided by 25.4 divided by 2 – e.g. 2.5/25.4/2 will equal .0492. Move the cursor to highlight the “Nose Vector” field and change it to 7 for both Tool #1 and #2. Move the cursor to highlight the “Description” field and enter the description for the tools being used as shown in Screen Shot 11.

**Note:** The X and Z offset values for Tool #2 will be different for the tool that you are using then what is shown in Screen Shots 8 thru 11.

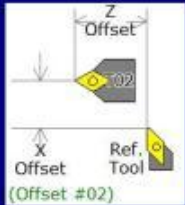
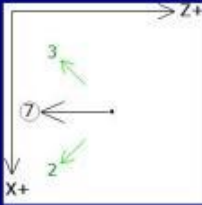
WCS #1 (G54)    Current Position (Inches)

**X** +0.0000

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**Z** +0.0000

Job Name: mpu11wheelplain-v2.txt  
 Tool: T0202  
 Feedrate: 100% 0.0 ipm  
 Spindle: -188 M  
 Coolant

Tool Library

Off. #	Tool Loc	Tool Orient	Tool Type	Approach	X Offset	Z Offset	Nose Radius	Nose Vector	Spin Dir	Description
01	T01	FFace	Custom	Front	0.0000	0.0000	0.0492	7	CW	Probe
02	T02	FFace	Turn	Front	0.2159	-1.4500	0.0472	7	CW	Turning tool
03	T03	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
04	T04	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
05	T05	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
06	T06	FFace	Turn	Front	0.0000	0.0000	0.0313	7	CW	
07	T07	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
08	T08	FFace	Turn	Front	0.0000	0.0000	0.0313	7	CW	
09	T09	FFace	Turn	Front	0.0000	0.0000	0.0156	7	CW	
10	T10	FFace	Turn	Front	0.0000	0.0000	0.0000	7	CW	

X Diam: 0.0000  
 Z Ref: 0.0000

Entry mode: absolute

Measure Tool F2	Abs Inc F4	+.001 F5	-.001 F6	+.0001 F7	-.0001 F8	Tool Wear F9	Save F10
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Screen Shot 11